[redacted]



OPERATIVE PROCEDURE

OPERATIVE PROCEDURE

This book was first published in the United States of America, where it has proved of great service to surgeons and medical students alike

The few copies which reached this country were so warmly welcomed that the publishers decided to print a British edition of the book

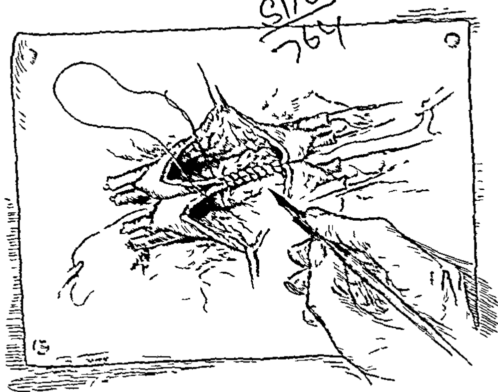
Text and illustrations remain identical with those in the original American edition

Johnson & Johnson (GREAT BRITAIN) LIMITED

Slough Bucks England

1944

Printed and made in England at the Fanfare Press London



The Origin and Function of the 'Operative Procedure' Series

This series of plates published by Johnson & Johnson in the leading surgical journals of the United States of America was prepared in collaboration with the staff of Surgery Gynecology and Obstetrics

THE SURGEON who casually views or carefully studies these illustrations will realize that they are not to be found elsewhere in medical or surgical literature As originals, it is understood that they have to be carefully prepared but the amount of effort expended in selecting the subject and then later selecting the important steps to be illustrated may not be comprehended as quickly

There is probably no branch of science or art which has given more evidence of progress in the last two decades than the science of surgical technique The perfection of older methods and originality in new methods have given to the world a mass of material which is worthy of careful immediate study and preservation for future reference

The selection of the subjects in this series was made with the help of several surgeons whose practice and experience enabled the pointing out of not only the most timely technique but likewise the outstanding steps In this way the artist was furnished with material from which he might accurately illustrate approved technique in a new and original manner

LIGATURE DEPARTMENT

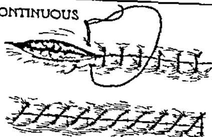
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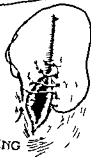
SLOUGH BUCKS

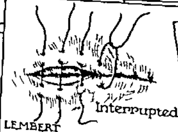
SUTURE TECHNIQUE (NO 1)



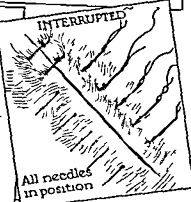


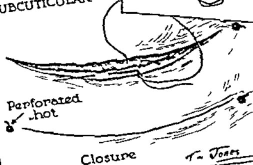


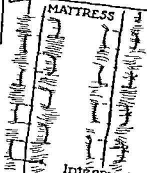












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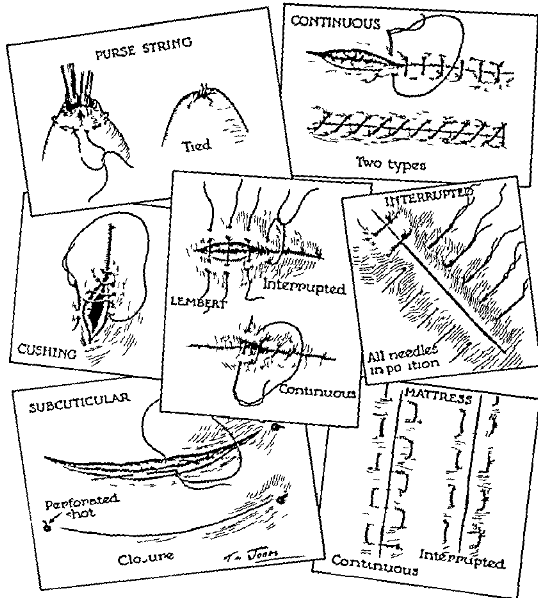
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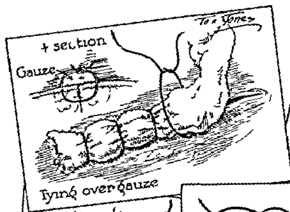
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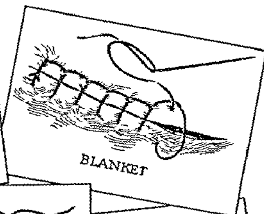
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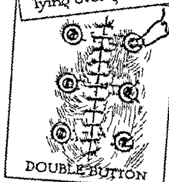
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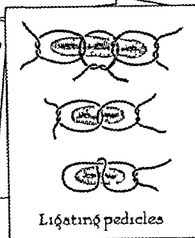


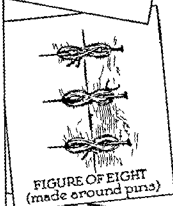
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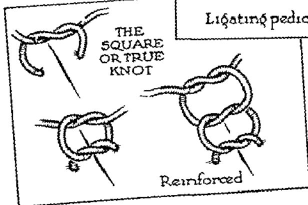


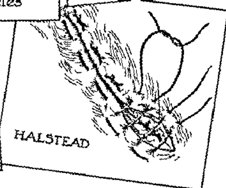




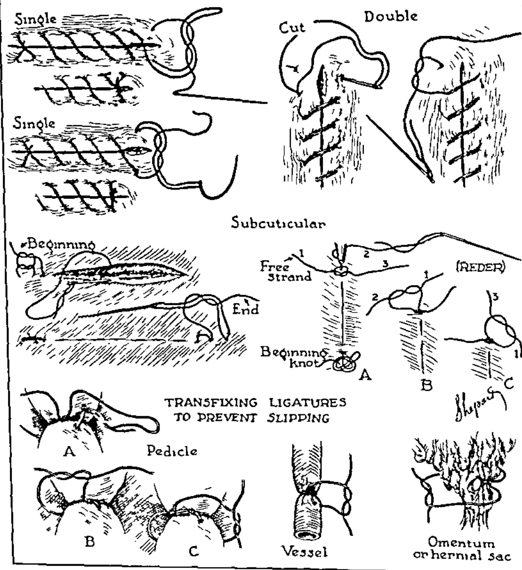


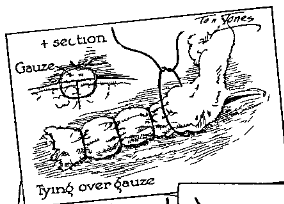


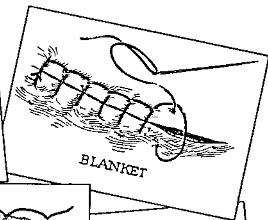


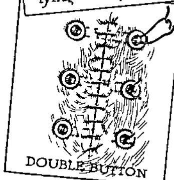


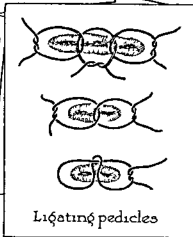
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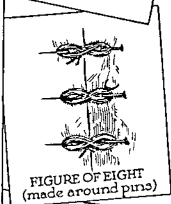


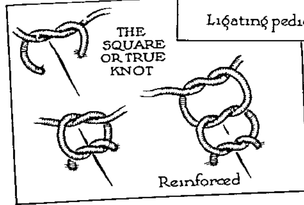

+ section
Gauze
Jones
Tying over gauze

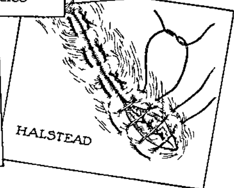

BLANKET


DOUBLE BUTTON

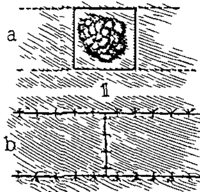

Ligating pedicles

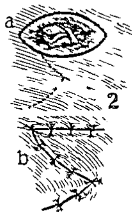

FIGURE OF EIGHT
(made around pins)

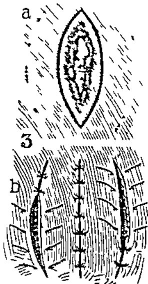

THE SQUARE OR TRUE KNOT
Reinforced

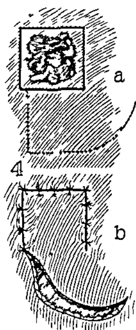

HALSTEAD

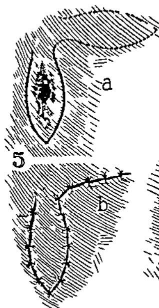
CLOSURE OF SKIN DEFECTS

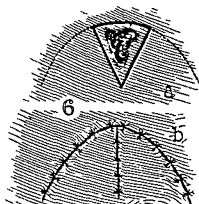




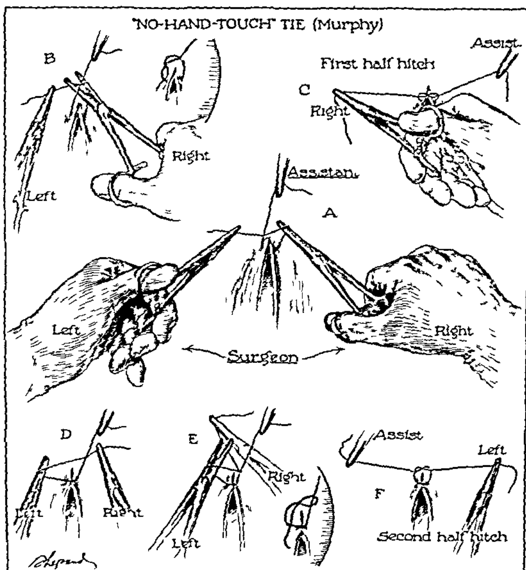




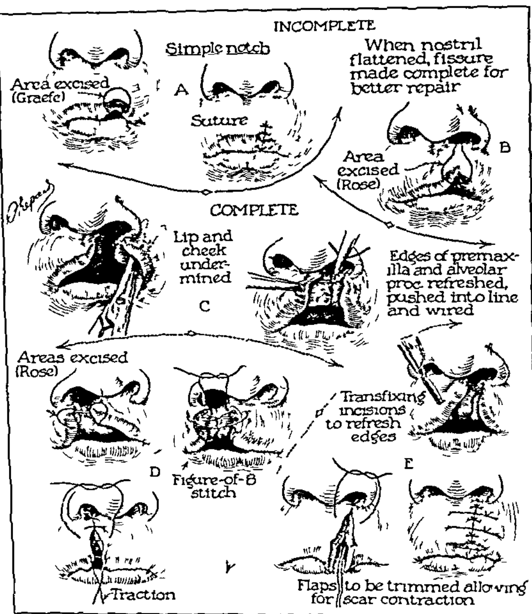




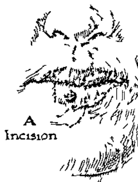
SUTURE TECHNIQUE (NO 4)



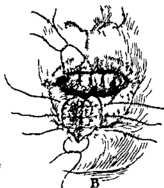
OPERATIONS FOR HARELIP—SINGLE CLEFT



EARLY CASE



A
Incision

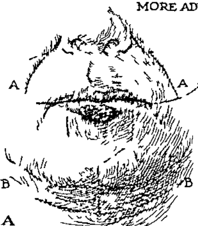


B
Sutures in position (Stitches in mucous membrane tied first)

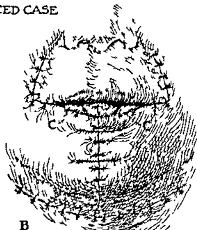


C
Sutures tied (Note fulness in center to prevent subsequent notching)

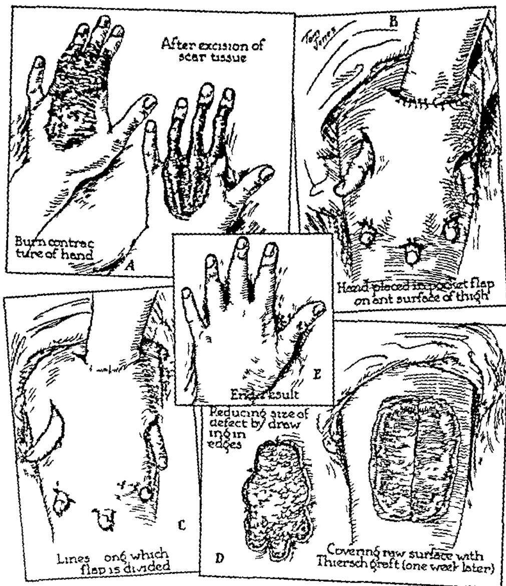
MORE ADVANCED CASE

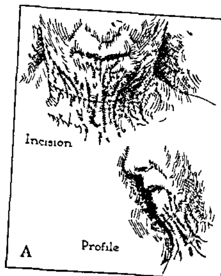


A
Incisions AA Triangles of skin removed to permit reconstruction of lower lip BB Incision for removal of lymph nodes



B
Operation completed Note reconstructed vermilion border CC of mucous membrane of cheek

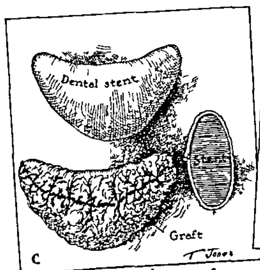

After excision of scar tissue
Burn contrac ture of hand
A
B
Hand placed in pocket flap on ant surface of thigh
End result
E
Reducing size of defect by drawing in edges
Lines along which flap is divided
C
D
Covering raw surface with Thiersch graft (one week later)



Burn contracture of neck



Raw surface resulting from simple division of scar and freeing of tension

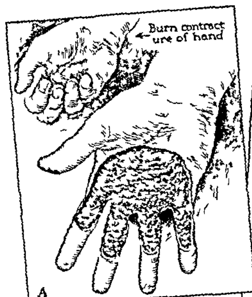


Graft with raw surface outward wrapped about mold of dental stent



Graft covered mold buried in raw surface

SKIN GRAFTING—FREE FULL THICKNESS GRAFTS

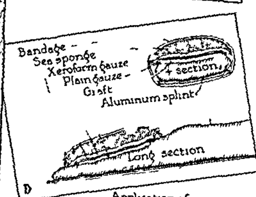


Extent of raw surface resulting from excision of scar





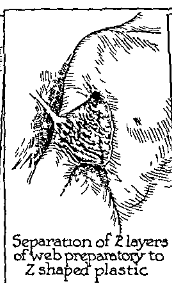
Suture of graft completed with fine sutures

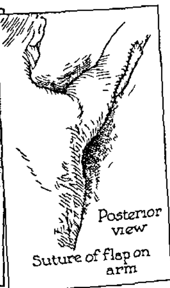


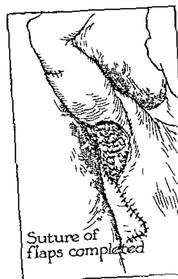
Application of pressure dressing over graft

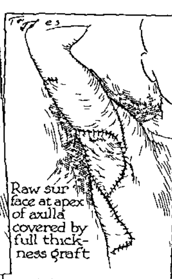
TREATMENT OF BURN CONTRACTURE OF AXILLA



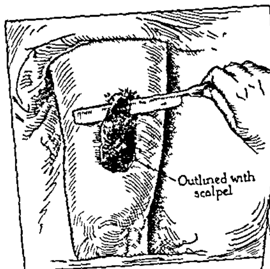








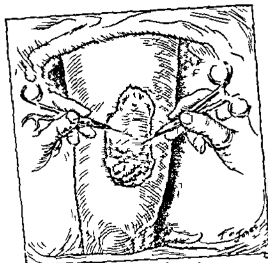




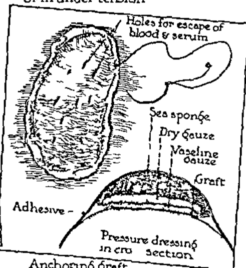
Excision of granulation tissue from raw area



Cutting of graft
Skin under tension

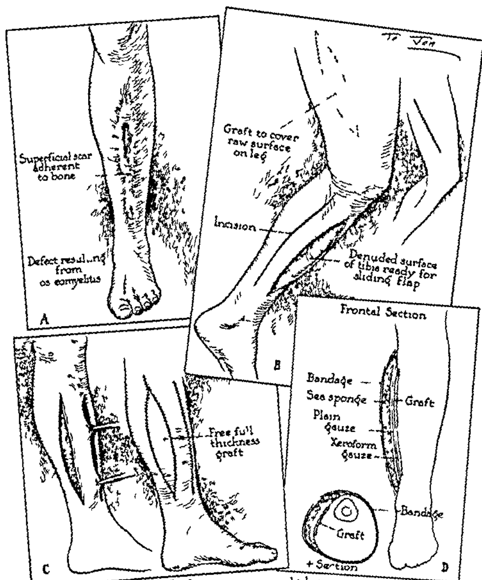


Teasing graft into position with needles

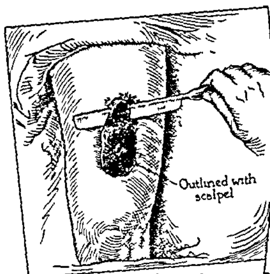


Anchoring graft
with fine skin suture

FULL THICKNESS GRAFT WITH SLIDING FLAP



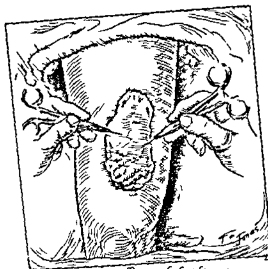
Flap shifted to cover exposed tibia
Resulting raw surface covered by graft



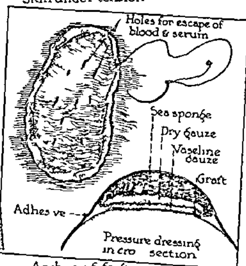
Excision of granulation tissue from raw area



Cutting of graft
Skin under tension

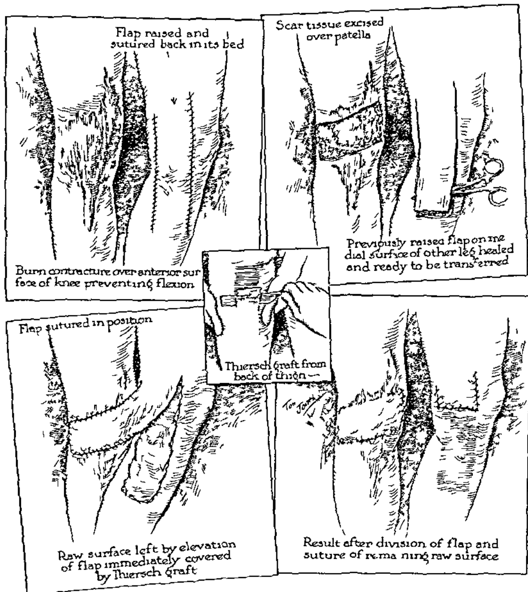


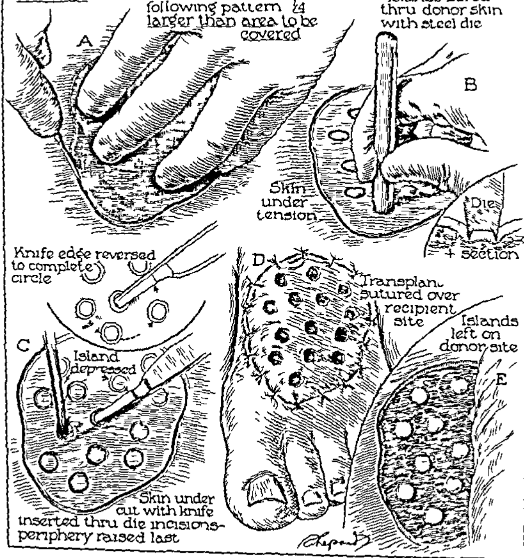
Teasing graft into position with needles



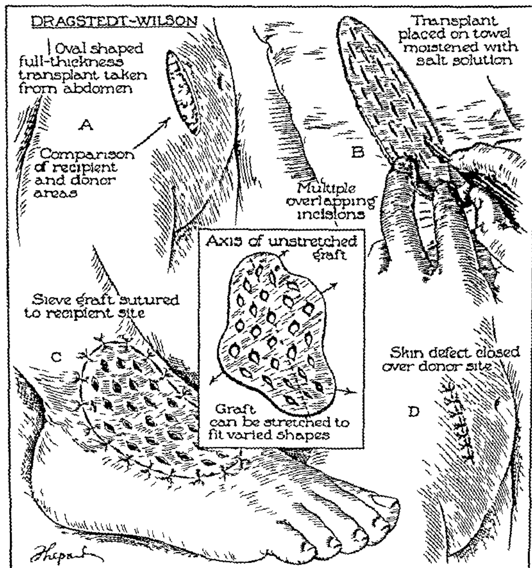
Anchoring graft
with fine skin suture

DELAYED PEDICLED FLAP

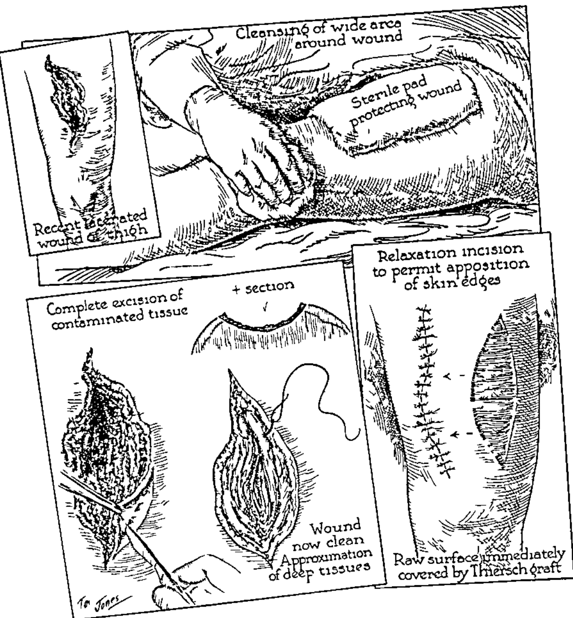



DOUGLAS
Donor skin incised following pattern 1/4 larger than area to be covered
A
Islands bored thru donor skin with steel die
B
Skin under tension
Die
+ section
Knife edge reversed to complete circle
D
Transplant sutured over recipient site
Islands left on donor site
C
Island depressed
E
Skin under cut with knife inserted thru die incisions-periphery raised last

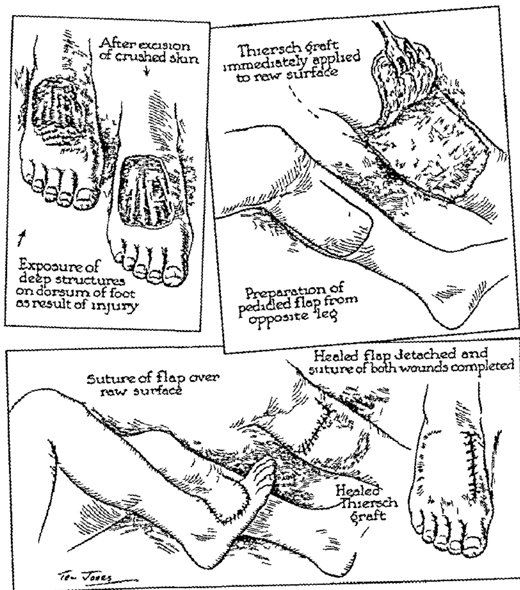
SKIN GRAFTING—SIEVE GRAFT (NO 2)

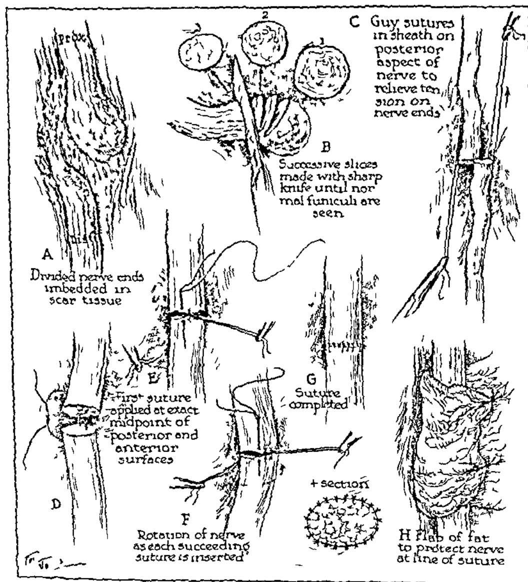


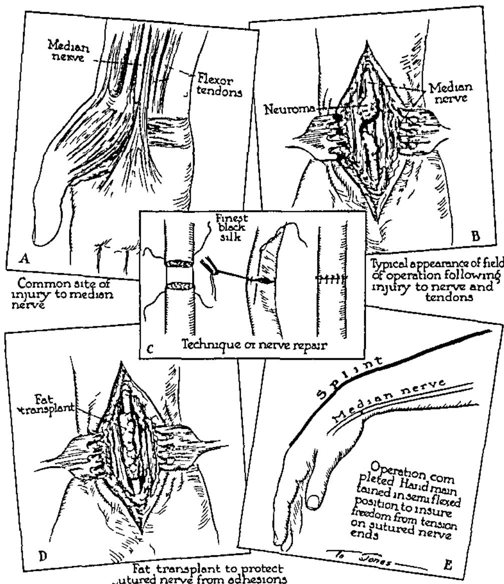
IDEAL TREATMENT OF LACERATED WOUND



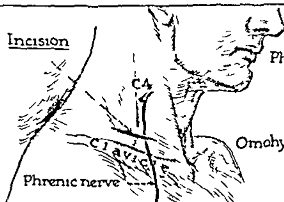
IMMEDIATE TREATMENT OF CRUSHING INJURY OF FOOT

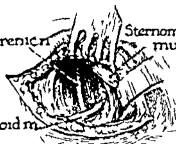


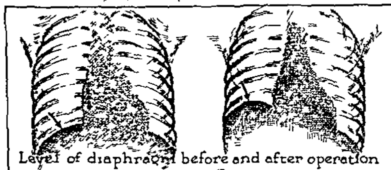

Prox.
Dis.
A
Divided nerve ends imbedded in scar tissue
2
1
B
Successive slices made with sharp knife until normal funiculi are seen
C Guy sutures in sheath on posterior aspect of nerve to relieve tension on nerve ends
D
E
First suture applied at exact midpoint of posterior and anterior surfaces
F
Rotation of nerve as each succeeding suture is inserted
G
Suture completed
+ section
H Flap of fat to protect nerve at line of suture

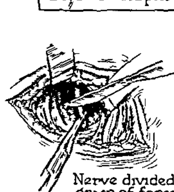

Median nerve
Flexor tendons
A
Common site of injury to median nerve
Neuroma
Median nerve
B
Typical appearance of field of operation following injury to nerve and tendons
Finest black silk
C
Technique or nerve repair
Fat transplant
D
Fat transplant to protect sutured nerve from adhesions
Splint
Median nerve
Operation completed Hand maintained in semi flexed position to insure freedom from tension on sutured nerve ends
E

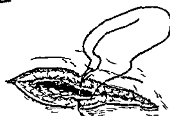
PHRENIC NEURECTOMY

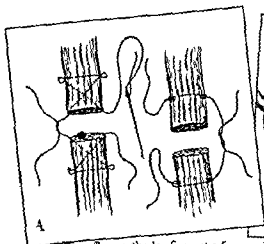




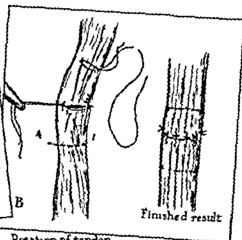




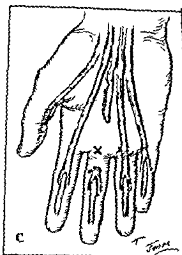




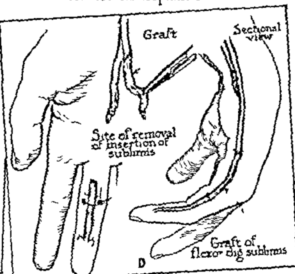
Two methods of inserting stay sutures in divided tendons



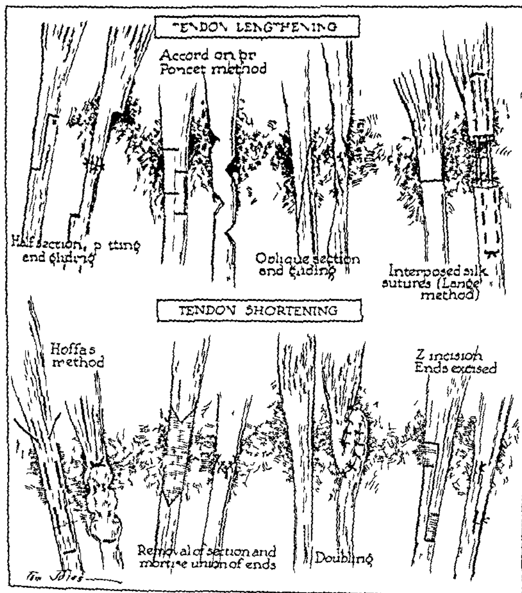
Rotation of tendon to permit insertion of sutures for accurate coaptation



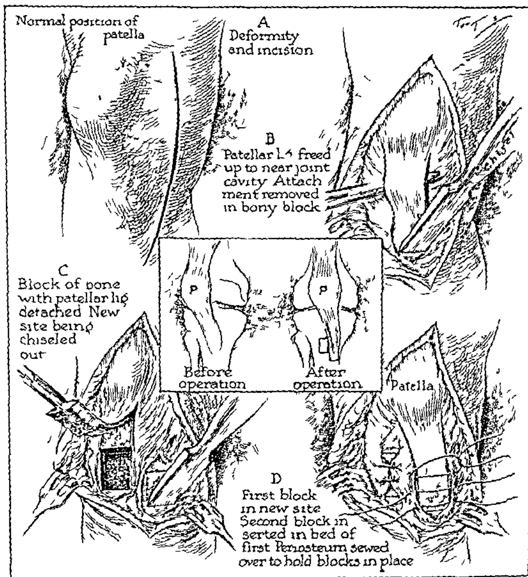
A common site (x) of tendon injury with resulting retraction of tendon ends



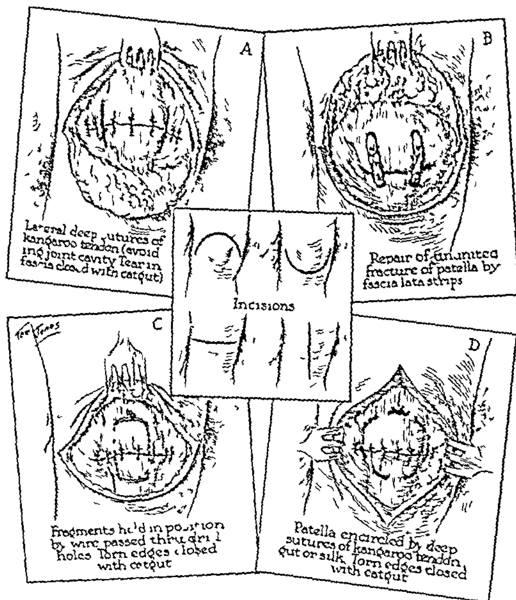
Technique of repair (Finger semi flexed)

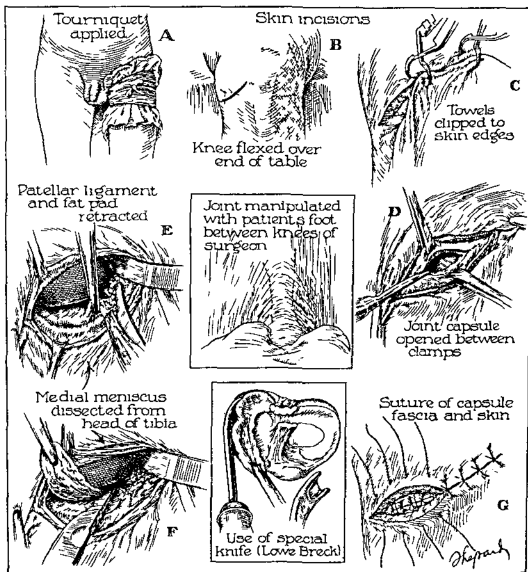

TENDON LENGTHENING
Accordion or Poncet method
Half section, splitting and gliding
Oblique section and gliding
Interposed silk sutures (Lange method)
TENDON SHORTENING
Hoffa's method
Z incision Ends excised
Removal of section and mortise union of ends
Doubling

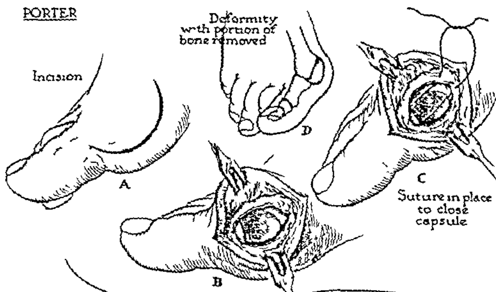
REPAIR OF RECURRENT DISLOCATION OF PATELLA

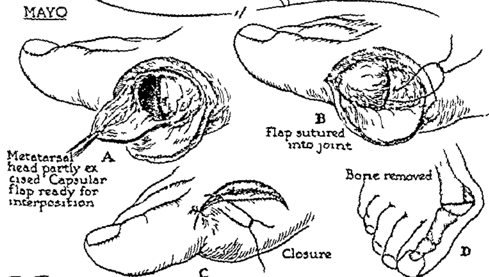


REPAIR OF FRACTURED PATELLA

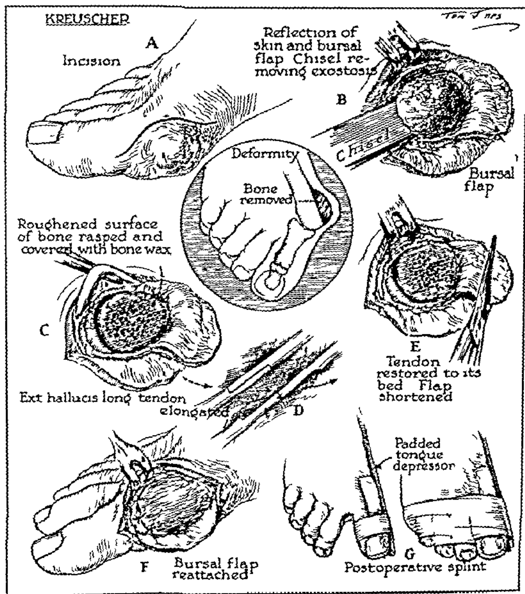



Tourniquet applied
A
Skin incisions
B
Knee flexed over end of table
C
Towels clipped to skin edges
Patellar ligament and fat pad retracted
E
Joint manipulated with patient's foot between knees of surgeon
D
Joint capsule opened between clamps
Medial meniscus dissected from head of tibia
F
Use of special knife (Lowe Breck)
Suture of capsule fascia and skin
G
Shepard

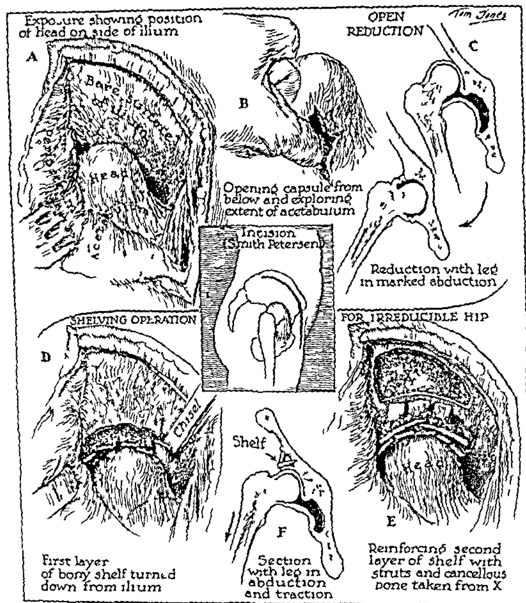

PORTER
Deformity with portion of bone removed
Incision
D
A
C
Suture in place to close capsule
B


MAYO
B
Flap sutured into joint
Metatarsal head partly excised Capsular flap ready for interposition
A
Bone removed
Closure
C
D

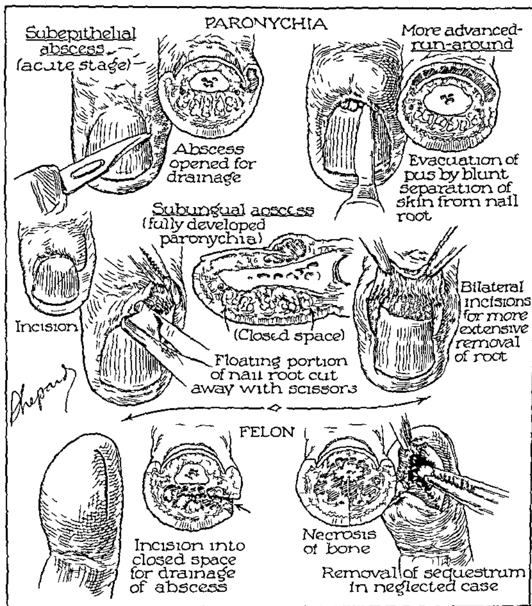
OPERATIVE TREATMENT OF BUNIONS (NO 2)



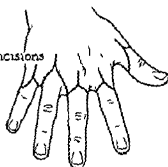
OPERATION FOR CONGENITAL DISLOCATED HIP

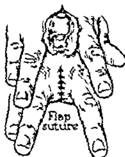


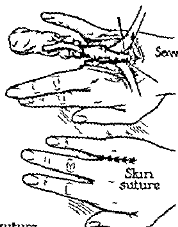
SURGICAL TREATMENT FOR PARONYCHIA AND FELON



METACARPOPHALANGEAL DISARTICULATION AND AMPUTATION PROXIMAL TO THE METACARPAL HEAD

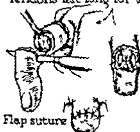


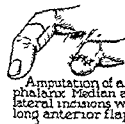




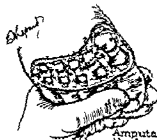
INTERPHALANGEAL DISARTICULATION





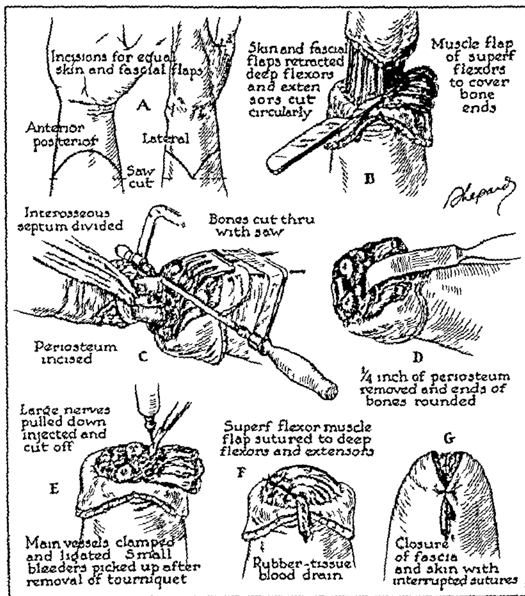


DISARTICULATION OF THE TOES

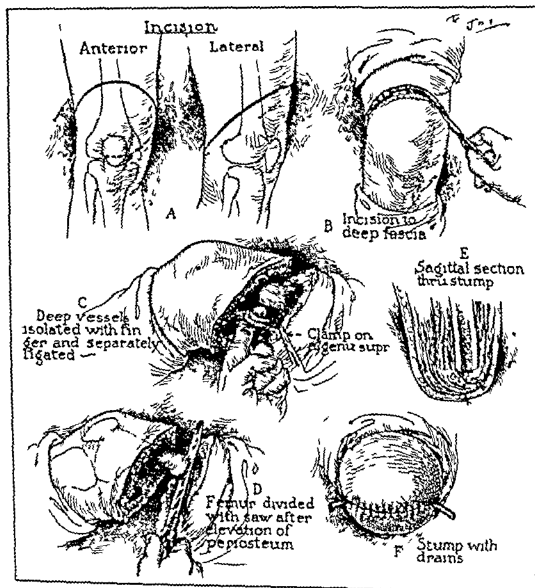




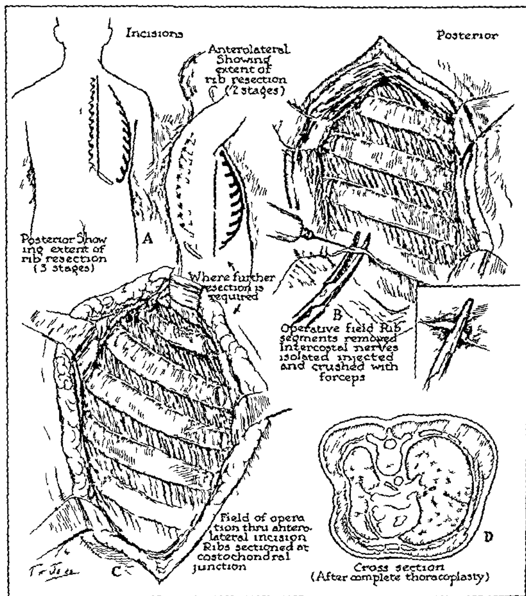


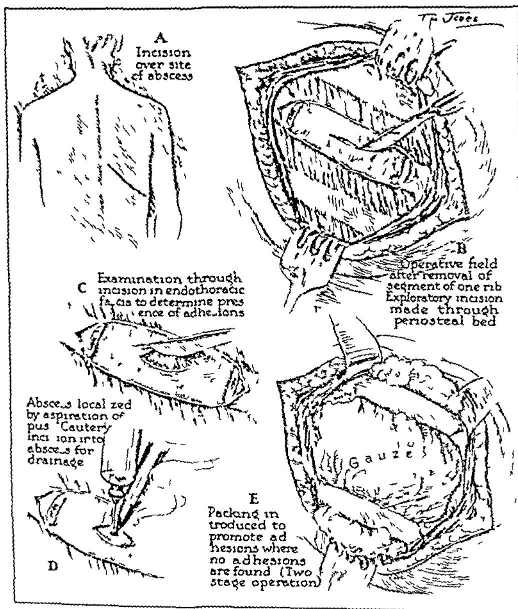

Incisions for equal skin and fascial flaps
A
Anterior posterior
Lateral
Saw cut
Skin and fascial flaps retracted deep flexors and extensors cut circularly
Muscle flap of superf flexors to cover bone ends
B
Interosseous septum divided
Bones cut thru with saw
Periosteum incised
C
D
¼ inch of periosteum removed and ends of bones rounded
Large nerves pulled down injected and cut off
E
Main vessels clamped and ligated Small bleeders picked up after removal of tourniquet
Superf flexor muscle flap sutured to deep flexors and extensors
F
Rubber-tissue blood drain
G
Closure of fascia and skin with interrupted sutures

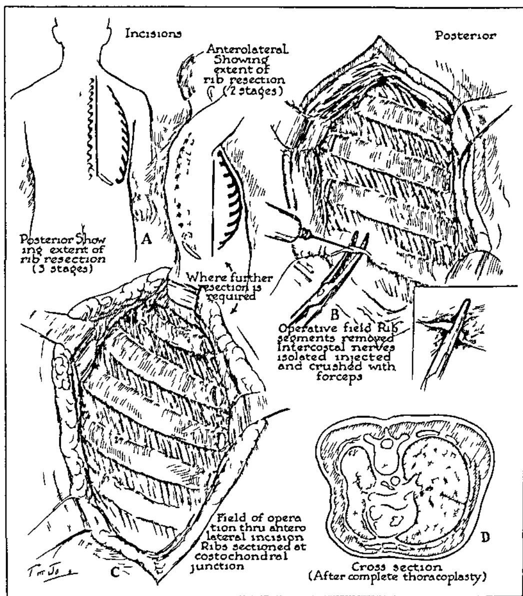
AMPUTATION FOR GANGRENE OF LOWER EXTREMITY



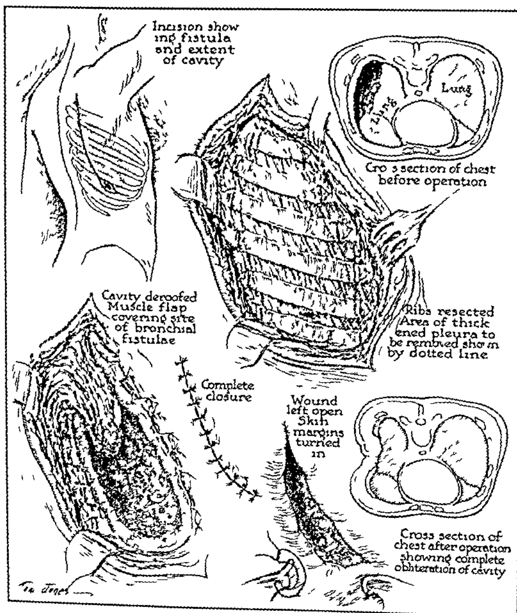
THORACOPLASTY



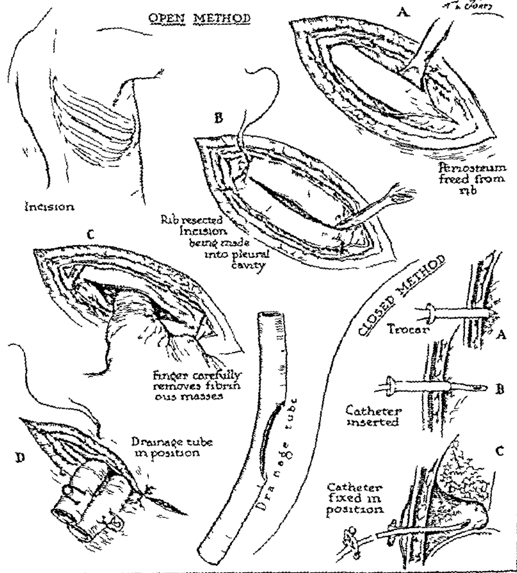

A
Incision over site of abscess
B
Operative field after removal of segment of one rib Exploratory incision made through periosteal bed
C
Examination through incision in endothoracic fascia to determine presence of adhesions
Abscess localized by aspiration of pus Cautery incision into abscess for drainage
D
Gauze
E
Packing introduced to promote adhesions where no adhesions are found (Two stage operation)


Incisions
Anterolateral Showing extent of rib resection (2 stages)
Posterior
Posterior Showing extent of rib resection (3 stages)
A
Where further resection is required
B
Operative field Rib segments removed Intercostal nerves isolated injected and crushed with forceps
Field of operation thru anterolateral incision Ribs sectioned at costochondral junction
C
D
Cross section (After complete thoracoplasty)

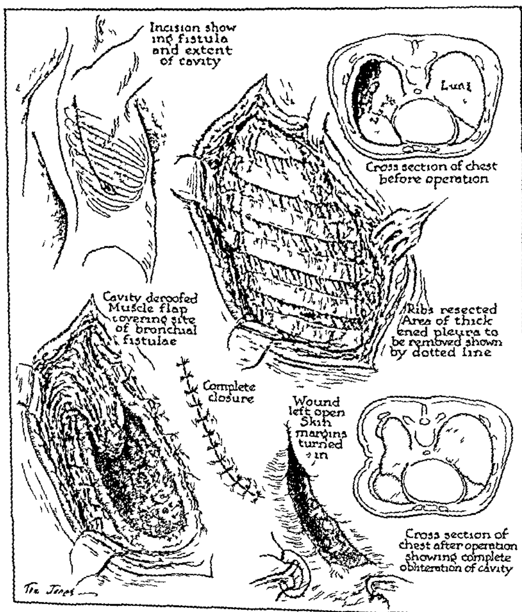
SURGICAL TREATMENT OF ACUTE EMPYEMA



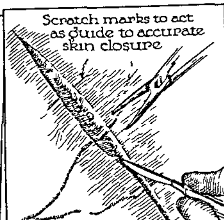
SURGICAL TREATMENT OF ACUTE EMPYEMA

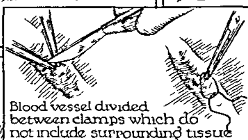


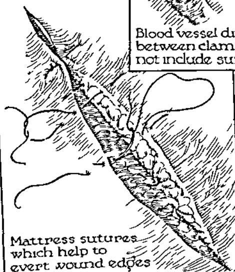
SURGICAL TREATMENT OF ACUTE EMPYEMA

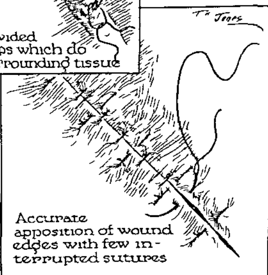



Holding skin
taut as incision
is made to
facilitate accur
ate technique

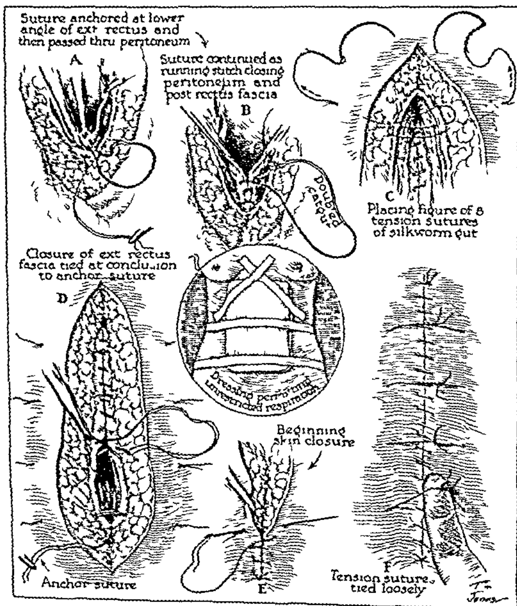

Scratch marks to act
as guide to accurate
skin closure
Blood
vessel ex-
posed and isolated
before division

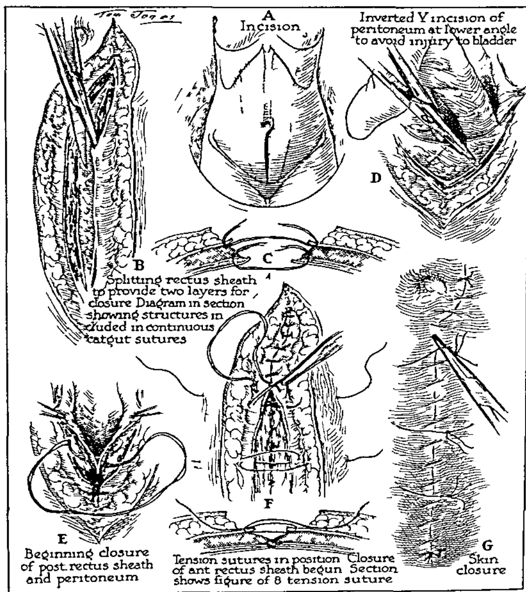

Blood vessel divided
between clamps which do
not include surrounding tissue


Mattress sutures
which help to
evert wound edges

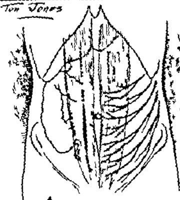

Accurate
apposition of wound
edges with few in-
terrupted sutures

CLOSURE OF RECTUS INCISION




Tom Jones
A
Incision
Inverted Y incision of peritoneum at lower angle to avoid injury to bladder
D
B
C
Splitting rectus sheath to provide two layers for closure Diagram in section showing structures included in continuous catgut sutures
F
E
Beginning closure of post. rectus sheath and peritoneum
Tension sutures in position Closure of ant rectus sheath begun Section shows figure of 8 tension suture
G
Skin closure

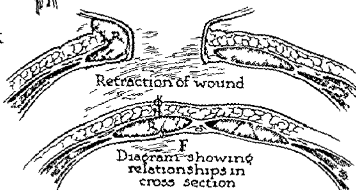
PARAMEDIAN INCISION FOR LAPAROTOMY







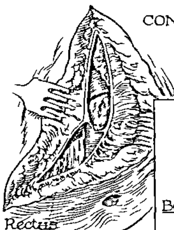


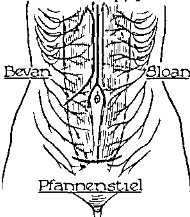


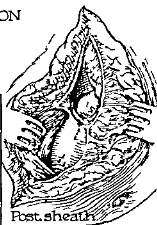


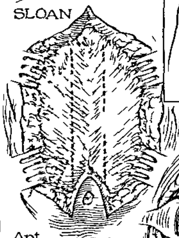
CONSERVING INNERVATION OF THE RECTI

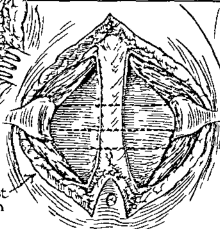
BEVAN
(Gall bladder on right side spleen on left)

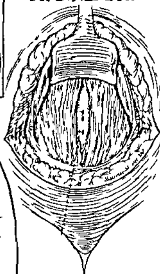








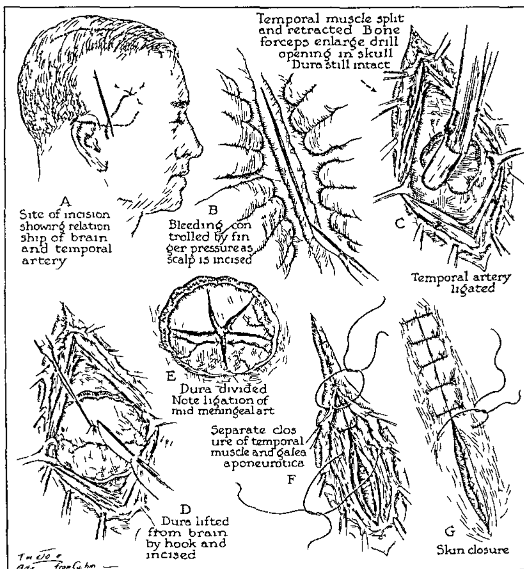


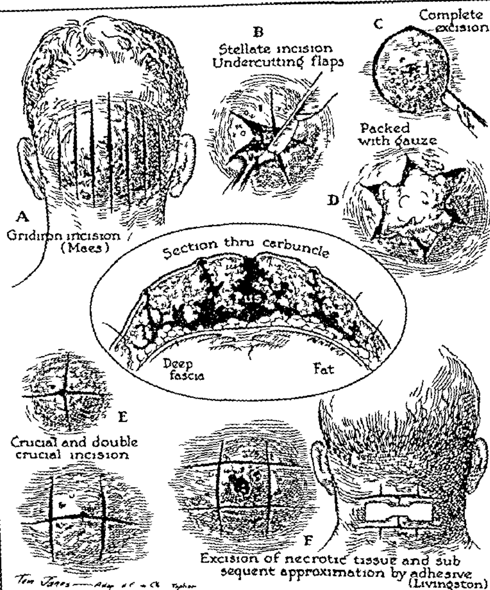


OPERATION FOR TORTICOLLIS

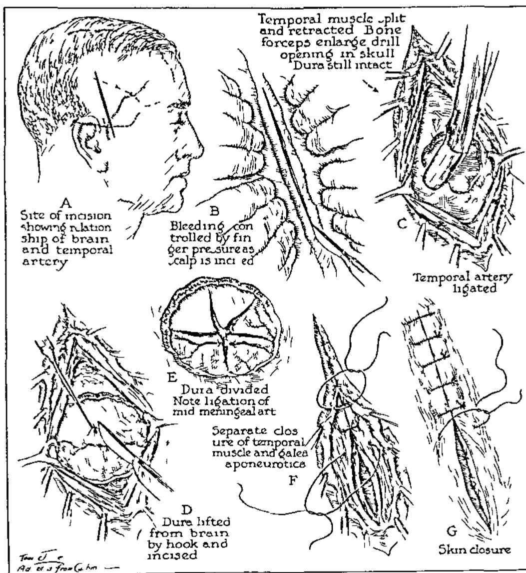


SUBTEMPORAL DECOMPRESSION

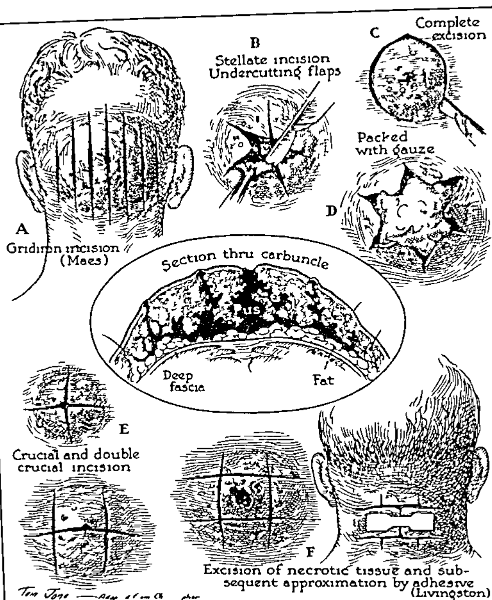



A
Gridiron incision
(Maes)
B
Stellate incision
Undercutting flaps
C
Complete
excision
Packed
with gauze
D
Section thru carbuncle
Deep
fascia
Fat
E
Crucial and double
crucial incision
F
Excision of necrotic tissue and sub
sequent approximation by adhesive
(Livingston)

SUBTEMPORAL DECOMPRESSION

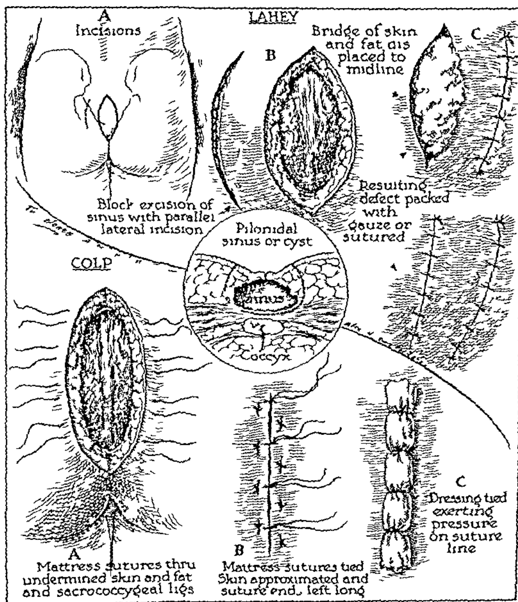


SURGICAL TREATMENT OF CARBUNCLE



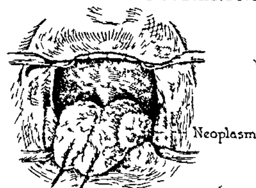
OPERATIVE TREATMENT OF

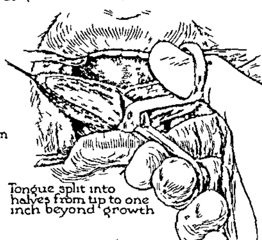
PILONIDAL SINUS

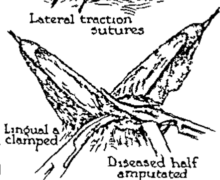


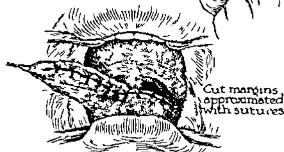
PARTIAL RESECTION OF THE TONGUE

RESECTION OF LATERAL HALF OF TONGUE FOR MALIGNANCY (WHITEHEAD)

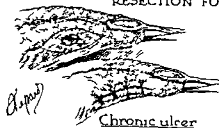


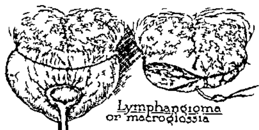


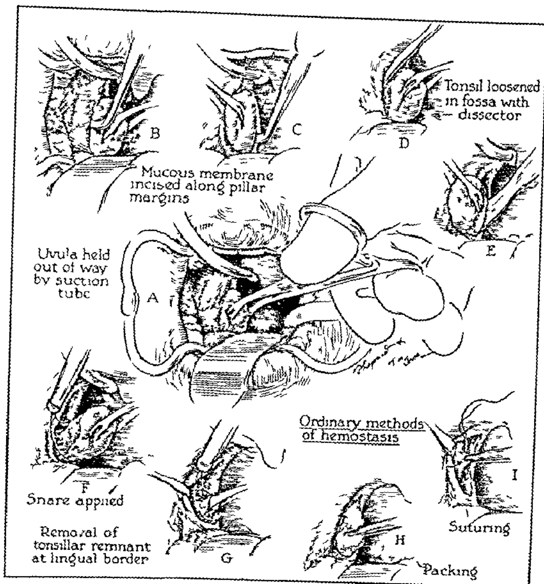


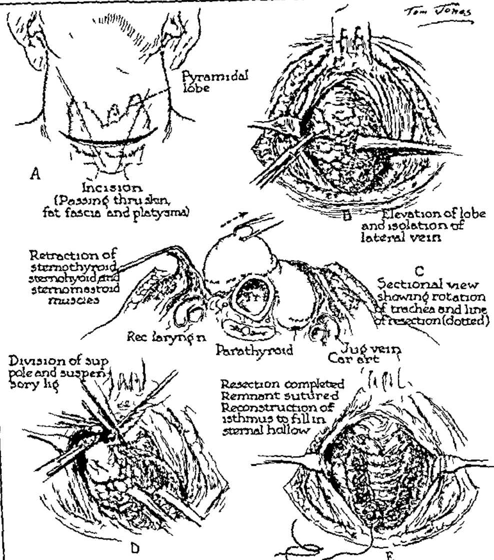


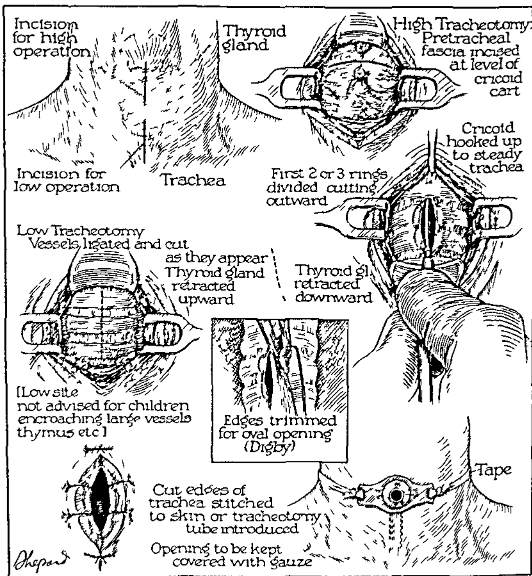
RESECTION FOR NON MALIGNANCY

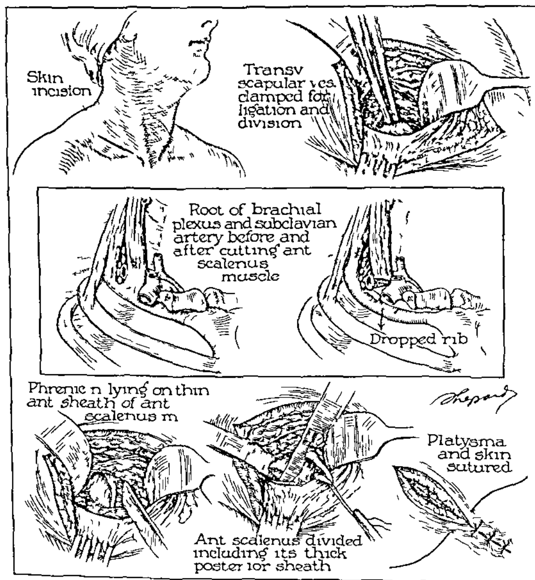


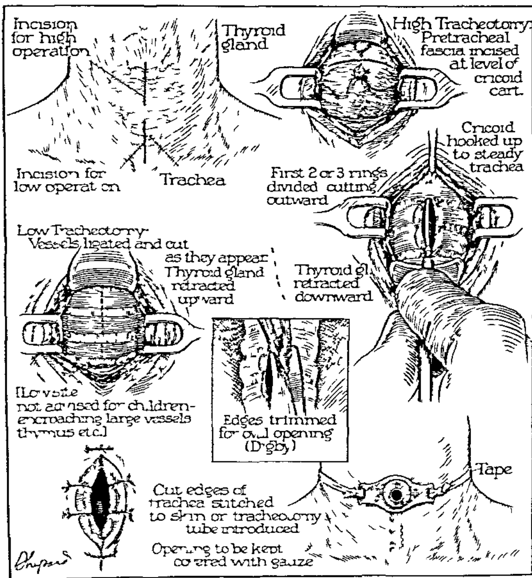



Tonsil loosened in fossa with dissector
B
C
D
Mucous membrane incised along pillar margins
E
Uvula held out of way by suction tube
A
F
Snare applied
Removal of tonsillar remnant at lingual border
G
Ordinary methods of hemostasis
I
Suturing
H
Packing

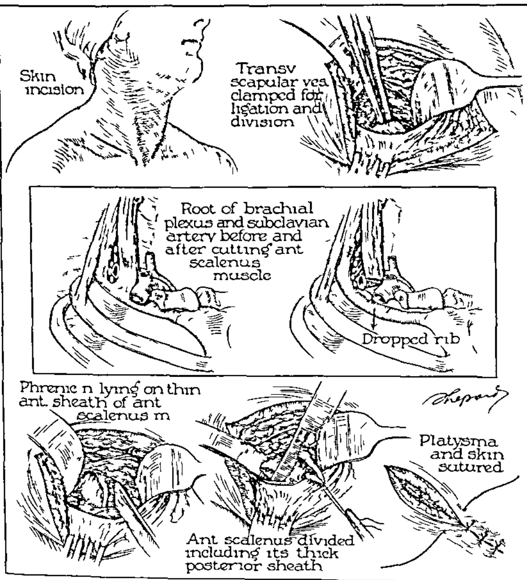

Tom Jones
Pyramidal lobe
A
Incision
(Passing thru skin, fat fascia and platysma)
B Elevation of lobe and isolation of lateral vein
Retraction of sternothyroid sternohyoid and sternomastoid muscles
C
Sectional view showing rotation of trachea and line of resection (dotted)
Rec laryng n
Parathyroid
Jug vein
Car art
Division of sup pole and suspensory lig
Resection completed
Remnant sutured
Reconstruction of isthmus to fill in sternal hollow
D
E

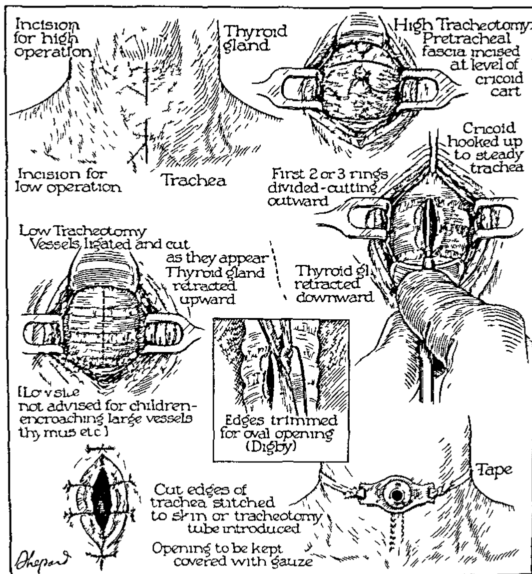

Incision for high operation
Thyroid gland
High Tracheotomy: Pretracheal fascia incised at level of cricoid cart
Incision for low operation
Trachea
Cricoid hooked up to steady trachea
First 2 or 3 rings divided cutting outward
Low Tracheotomy
Vessels ligated and cut as they appear
Thyroid gland retracted upward
Thyroid gl retracted downward
[Low site not advised for children encroaching large vessels thymus etc]
Edges trimmed for oval opening (Digby)
Tape
Cut edges of trachea stitched to skin or tracheotomy tube introduced
Opening to be kept covered with gauze
Shepard

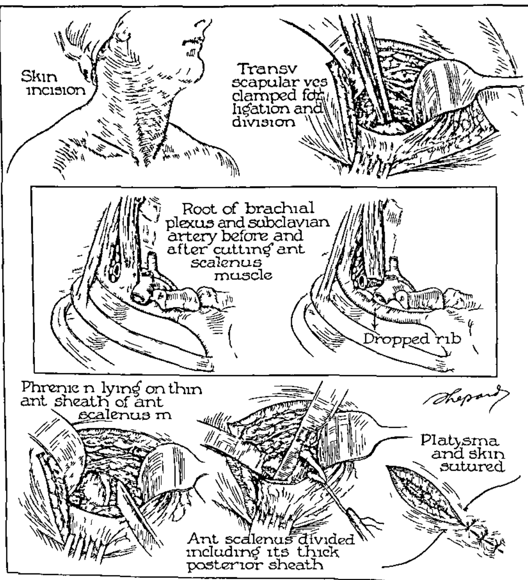

Skin incision
Transv scapular ves. clamped for ligation and division
Root of brachial plexus and subclavian artery before and after cutting ant scalenus muscle
Dropped rib
Phrenic n lying on thin ant sheath of ant scalenus m
Platysma and skin sutured
Ant scalenus divided including its thick posterior sheath

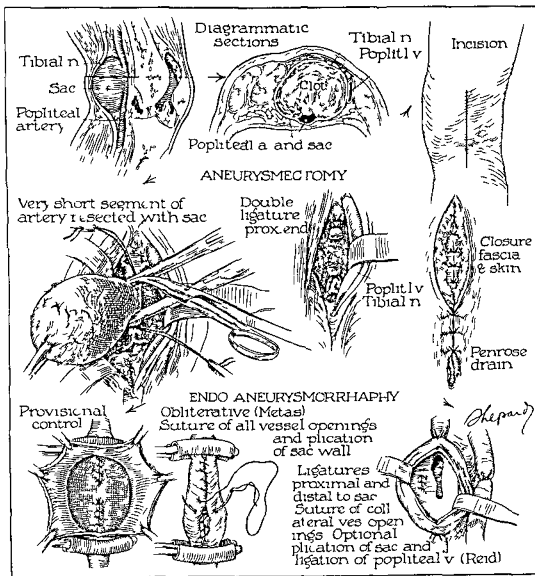


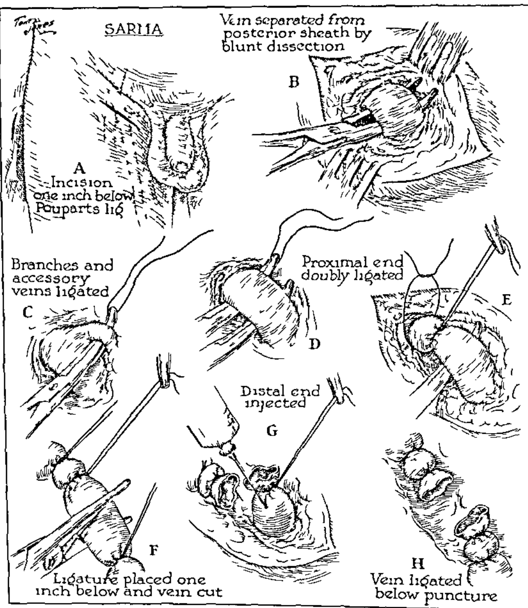
Incision for high operation
Thyroid gland
Incision for low operation
Trachea
High Tracheotomy: Pretracheal fascia incised at level of cricoid cart.
Cricoid hooked up to steady trachea
First 2 or 3 rings divided cutting outward
Low Tracheotomy: Vessels ligated and cut as they appear. Thyroid gland retracted upward
Thyroid gl. retracted downward
[Low site not advised for children- encroaching large vessels thymus etc.]
Edges trimmed for oval opening (Digby)
Tape
Cut edges of trachea stitched to skin or tracheotomy tube introduced
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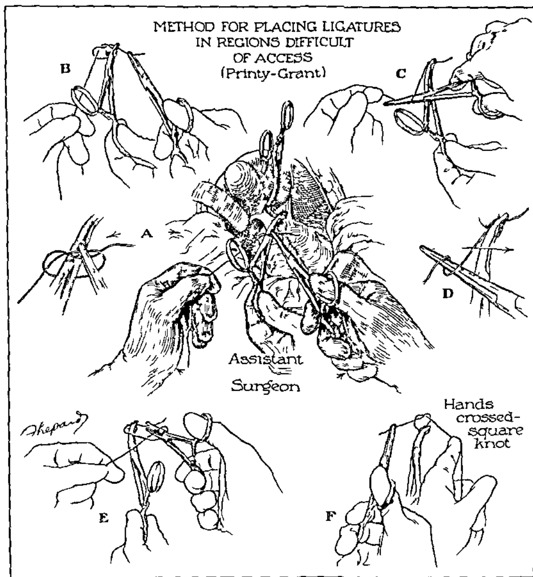

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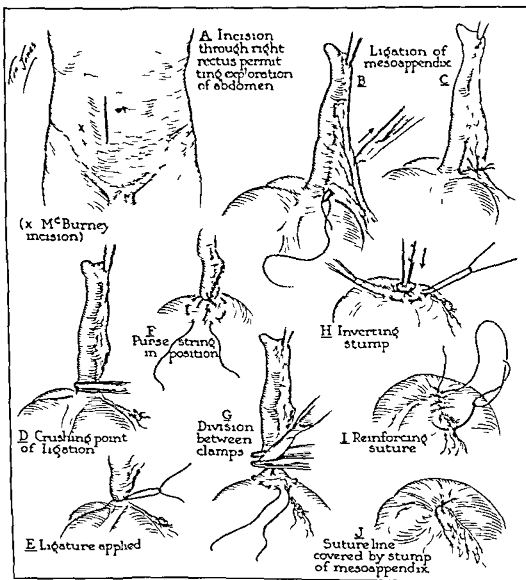

Incision for high operation
Thyroid gland
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Incision for low operation
Trachea
Cricoid hooked up to steady trachea
First 2 or 3 rings divided-cutting outward
Low Tracheotomy Vessels ligated and cut as they appear
Thyroid gland retracted upward
Thyroid gl retracted downward
[Low site not advised for children-encroaching large vessels thymus etc]
Edges trimmed for oval opening (Digby)
Tape
Cut edges of trachea stitched to skin or tracheotomy tube introduced
Opening to be kept covered with gauze
Shepard


Skin
incision
Transv
scapular ves
clamped for
ligation and
division
Root of brachial
plexus and subclavian
artery before and
after cutting ant
scalenus
muscle
Dropped rib
Phrenic n lying on thin
ant sheath of ant
scalenus m
Platysma
and skin
sutured
Ant scalenus divided
including its thick
posterior sheath

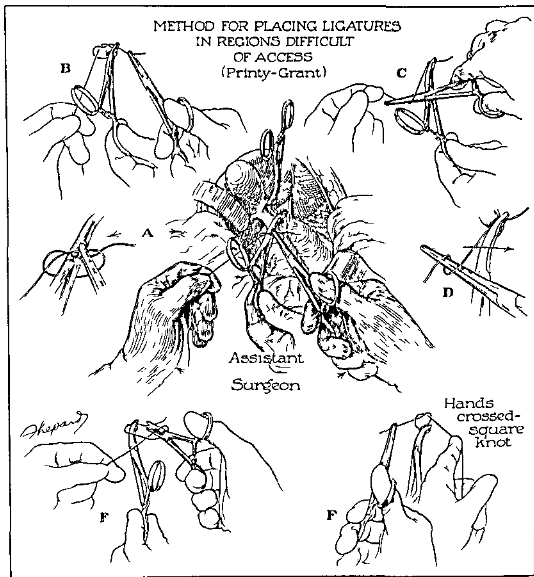

Diagrammatic sections
Tibial n
Popliteal v
Incision
Tibial n
Sac
Popliteal artery
Clot
Popliteal a and sac
ANEURYSMECTOMY
Very short segment of artery resected with sac
Double ligature prox. end
Closure fascia & skin
Poplit l v
Tibial n
Penrose drain
ENDO ANEURYSMORRHAPHY
Provisional control
Obliterative (Metas)
Suture of all vessel openings and plication of sac wall
Ligatures proximal and distal to sac
Suture of collateral ves openings Optional plication of sac and ligation of popliteal v (Reid)
Shepard


SARMA
Vein separated from posterior sheath by blunt dissection
B
A
Incision one inch below Pouparts lig
Branches and accessory veins ligated
C
Proximal end doubly ligated
D
E
Distal end injected
G
F
H
Ligature placed one inch below and vein cut
Vein ligated below puncture

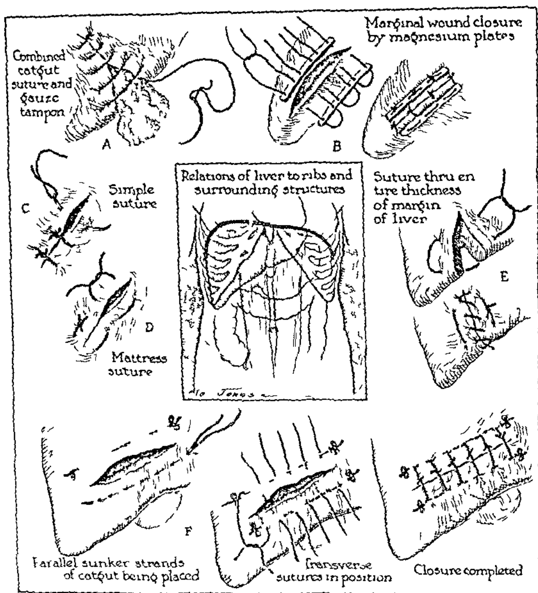

METHOD FOR PLACING LIGATURES
IN REGIONS DIFFICULT
OF ACCESS
(Printy-Grant)
B
C
A
D
Assistant
Surgeon
Hands
crossed-
square
knot
E
F

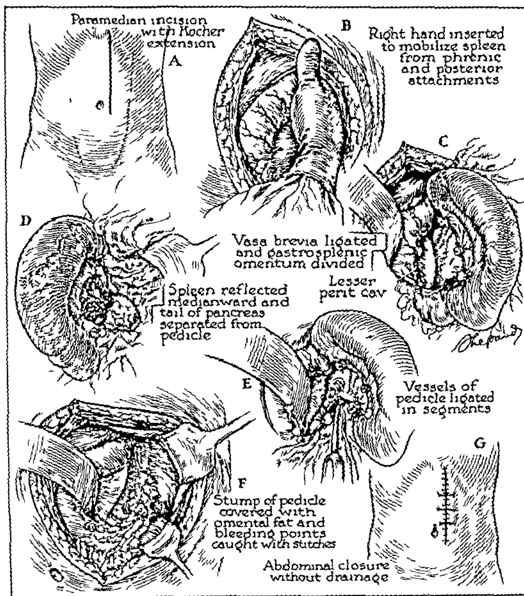


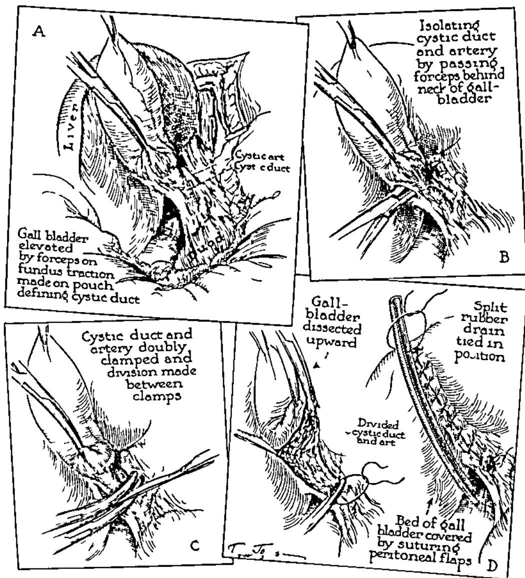
A Incision through right rectus permitting exploration of abdomen
(x McBurney incision)
Ligation of mesoappendix
B
C
D Crushing point of ligation
E Ligature applied
F Purse string in position
G Division between clamps
H Inverting stump
I Reinforcing suture
J Suture line covered by stump of mesoappendix

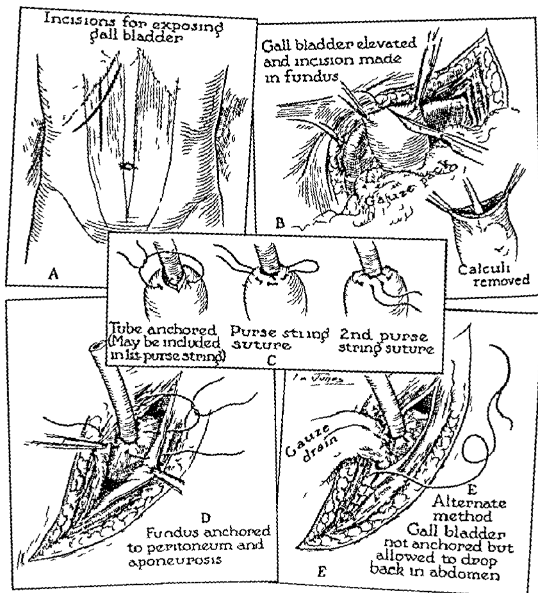

METHOD FOR PLACING LIGATURES
IN REGIONS DIFFICULT
OF ACCESS
(Printy-Grant)
B
C
A
D
Assistant
Surgeon
Hands
crossed-
square
knot
F
F
Shepard

LIVER SUTURES




Paramedian incision with Kocher extension
A
B
Right hand inserted to mobilize spleen from phrenic and posterior attachments
C
D
Vasa brevia ligated and gastrosplenic omentum divided
Lesser perit cav
Spleen reflected medianward and tail of pancreas separated from pedicle
E
Vessels of pedicle ligated in segments
G
F
Stump of pedicle covered with omental fat and bleeding points caught with sutches
Abdominal closure without drainage


A
Liver
Cystic art
Cyst c duct
Duod
Gall bladder elevated by forceps on fundus traction made on pouch defining cystic duct
Isolating cystic duct and artery by passing forceps behind neck of gall-bladder
B
Cystic duct and artery doubly clamped and division made between clamps
C
Gall-bladder dissected upward
Divided cystic duct and art
Split rubber drain tied in position
Bed of gall bladder covered by suturing peritoneal flaps
D


Incisions for exposing gall bladder
A
Gall bladder elevated and incision made in fundus
Gauze pack
B
Calculi removed
Tube anchored (May be included in 1st purse string)
Purse string suture
2nd purse string suture
C
Fundus anchored to peritoneum and aponeurosis
D
Gauze drain
E
Alternate method
Gall bladder not anchored but allowed to drop back in abdomen
E

HEPATICODUODENOSTOMY

Direct
Gatewood's case

Posterior and lateral sutures placed duodenum & hepatic duct incised

T tube

Modified Direct (W J Mayo)

Post and latrl sutures

Flap from crescent-shaped incision

Ant sutures

Plastic (Walton)

Flap sutured to liver capsule

Indirect (Jenckel)

Duod opening closed around tube

Long flap

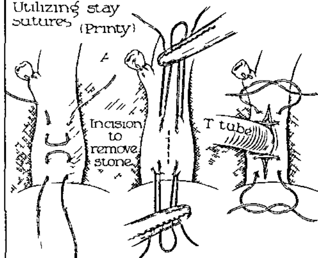
Witzel duodenostomy

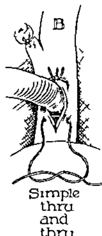
Exposed tube to be covered with adjacent tissues & omentum

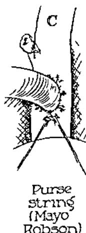
Flap sutured over tube to duodenum & duct

(Tube removed after epithelial outgrowth has lined new canal)

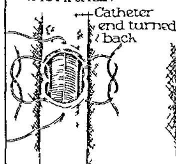
SUTURE OF THE COMMON DUCT AFTER REMOVAL OF STONE

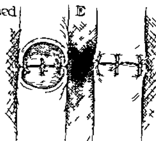


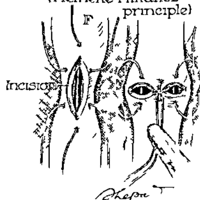


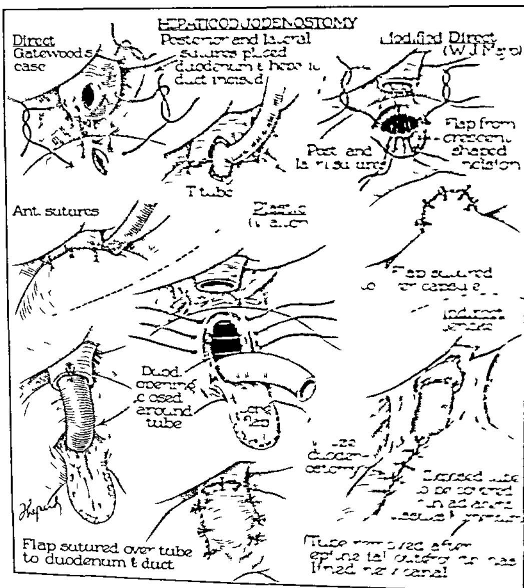


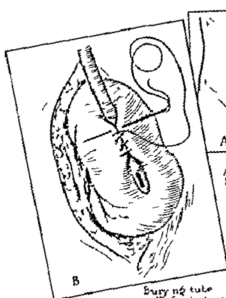
REPAIR OF INJURIES TO DUCT
(with or without drainage)



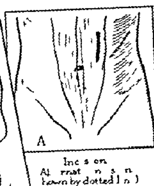




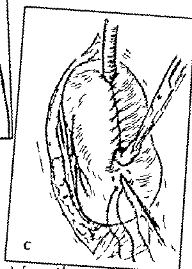

Direct
Gatewood's case
T tube
Ant. sutures
Duod. opening closed around tube
Flap sutured over tube to duodenum & duct



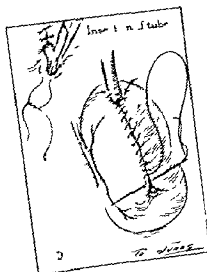
Bury ng tube
w ll of rt t ne

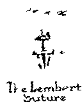


Inc s on
Al rnat n s n
hown by dotted l n)



Method of opening
the t e f i sert on of cathet r

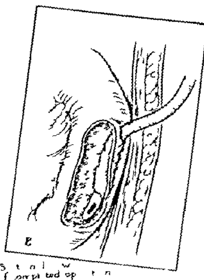




The Lembert
Suture

C m part e f
l re by com
& serosa

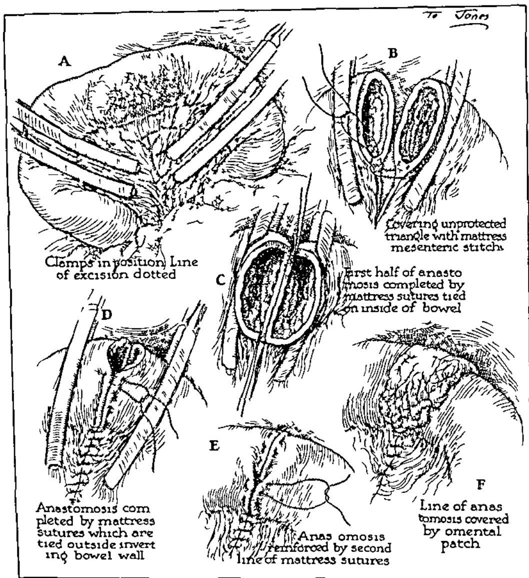
A ow th e
fixa n f t le
ry /le t h



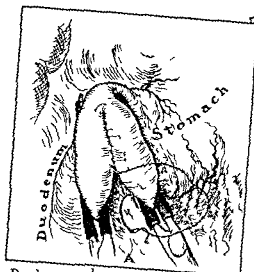
S t n l w
f omp l ted op t n

END TO END ENTERO ENTEROSTOMY

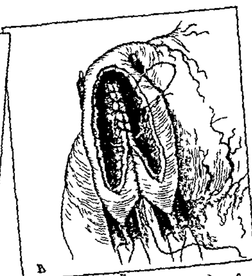
(DYAS)



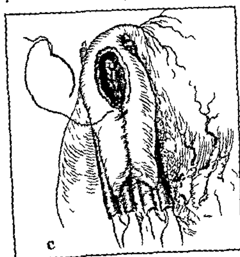
GASTRODUODENOSTOMY
(FINNEY'S TECHNIQUE)



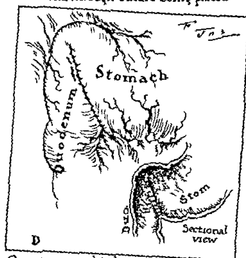
Duodenum and stomach clamped F rst line of sutures be ng placed Incision shown by dotted line



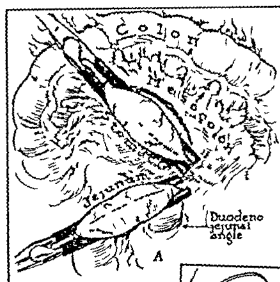
First or posterior line of sutures completed Inner through and through suture being placed



Anterior tier of sutures nearly completed



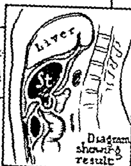
Operation completed
Outer line of seromus ular sutures seen

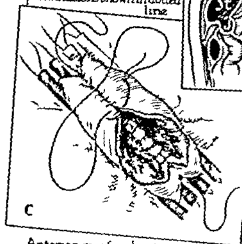


Stomach drawn thru slit meso colon, clamped & ready for approximation with fold of jejunum Proposed incisions shown in dotted line

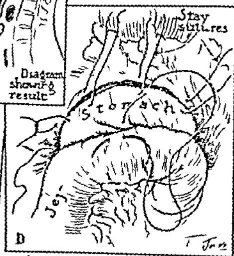


Posterior sero muscular suture placed Posterior marginal suture being placed



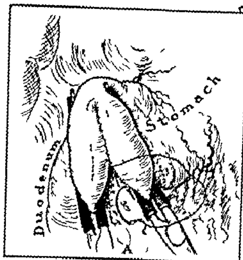


Anterior marginal suture



Anterior seromuscular suture

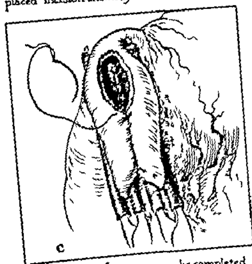
GASTRODUODENOSTOMY
(FINNEY'S TECHNIQUE)



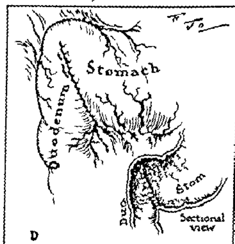
Duodenum and stomach clamped First line of sutures being placed Incision shown by dotted line



First or posterior line of sutures completed Inner through and through suture being placed

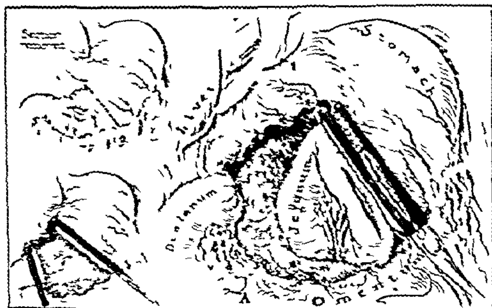


Anterior tier of sutures ne rly completed

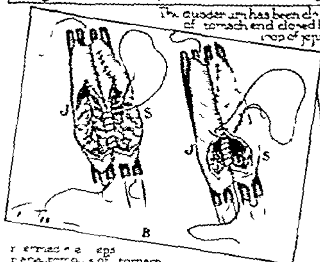


Operation compl ted
Outer line of seromuscular sutures seen

PARTIAL RESECTION OF STOMACH
(POLYA)



The duodenum has been [illegible] by [illegible] Upper [illegible] of stomach end closed by suture. Anastomosis between loop of jejunum and lower [illegible] of stomach opening begun



[illegible] steps [illegible] of stomach and [illegible]

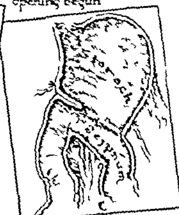
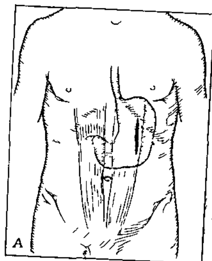


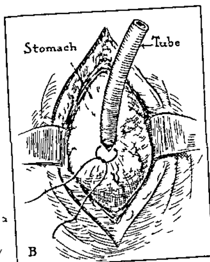
Diagram showing finished result in section

GASTROSTOMY
(STAMM METHOD)



Incision (Alternate incision shown by dotted l ne)



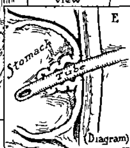


Tube fixed in stomach wall by single stitch

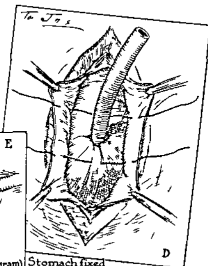


F rst purse string suture t ed Two others placed

Sect onal view

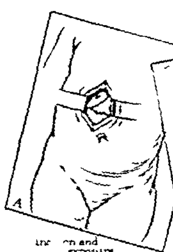


(Diagram)

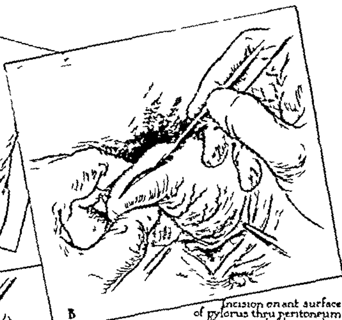


Stomach fixed to ant abdomin l wall

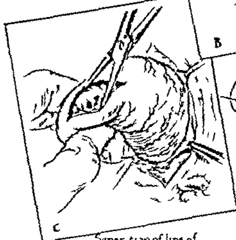
RAMMSTEDT OPERATION FOR PYLORIC STENOSIS



Inc on and exposure



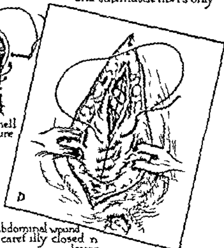
Incision on ant. surface of pylorus thru peritoneum and sub muscle fibers only



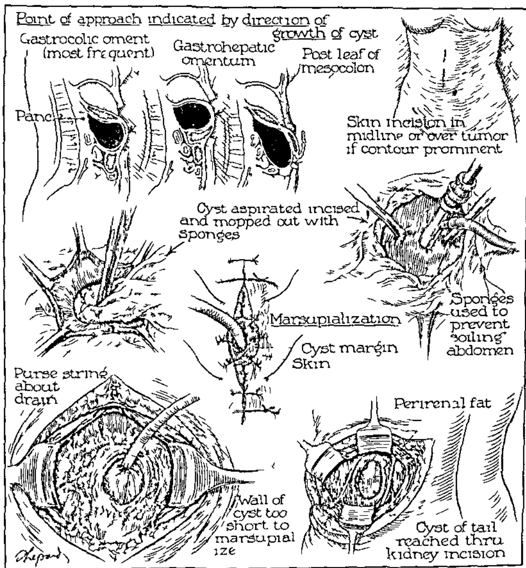
Separ tion of lips of inci ion allowing mu osa to protrude



Connell suture



Abdominal wound caref lly closed n layers


Point of approach indicated by direction of growth of cyst
Gastrocolic oment (most frequent)
Gastrohepatic omentum
Post leaf of mesocolon
Panc
Skin incision in midline or over tumor if contour prominent
Cyst aspirated incised and mopped out with sponges
Marsupialization
Sponges used to prevent soiling abdomen
Cyst margin
Skin
Purse string about drain
Perirenal fat
Wall of cyst too short to marsupialize
Cyst of tail reached thru kidney incision

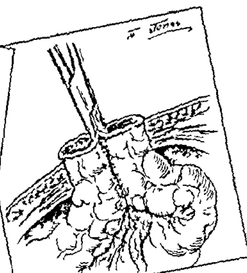
PARTIAL RESECTION OF COLON
(MIKULICZ)

Tumor

Line of excision

A

Loop of bowel sewed together and brought out through wound Note fixation to peritoneum and fascia Loop cut away after 4 to 8 days



5 to 7 days later crushing forceps lightly clamped on opposed bowel walls and tightened daily until septum is cut through

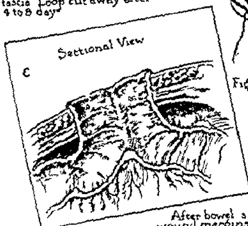
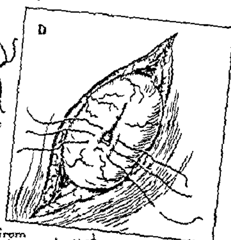


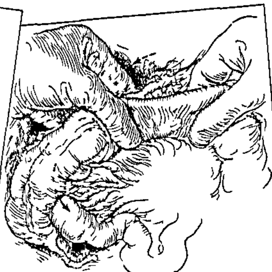
Figure of 8 suture



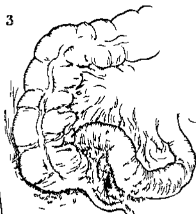
After bowel is freed from wound margins opening is invaginated and closed with Lembert sutures



Diagram showing invagination of il um into large bowel



Technique of reduction by pressure upon head of invaginated portion



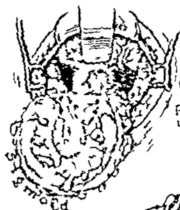
Reduct on completed

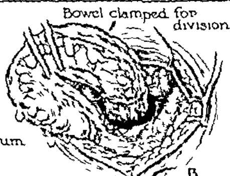


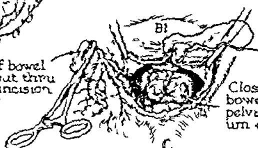
H lstead sutur

4

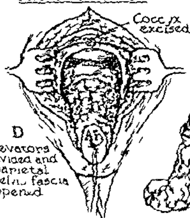
Suture of distal leu n to asc colon to prevent recurrence



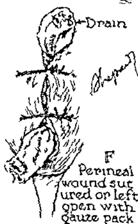




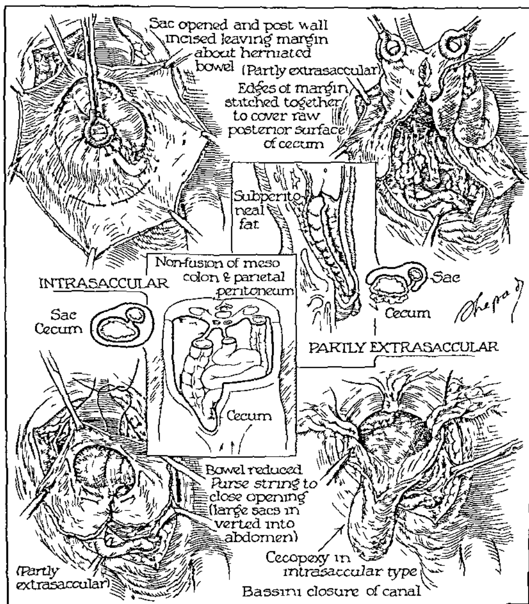
Perineal dissection



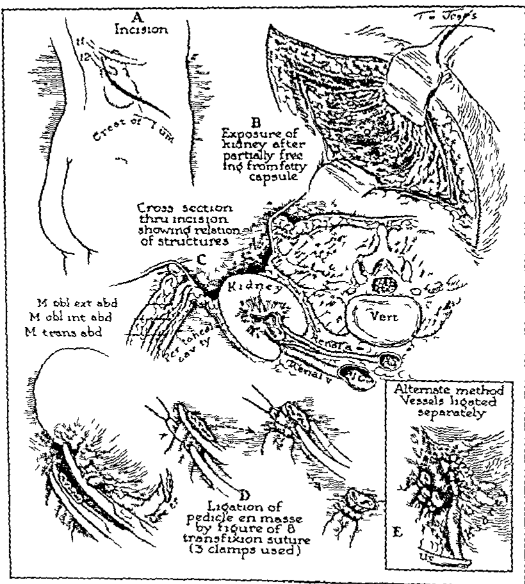




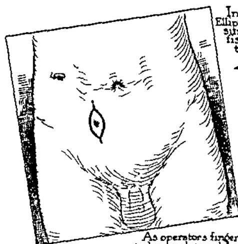
SLIDING HERNIA OF THE CECUM



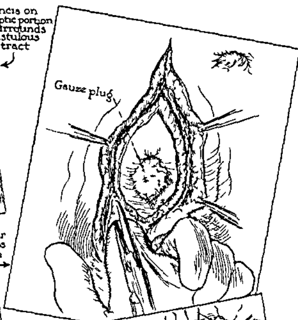
NEPHRECTOMY



FECAL FISTULA



Incis on Elliptic portion surrounds fistulous tract



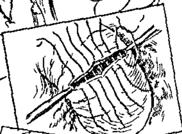
As operators finger explores relationships excision of tract is com pleted by scissors



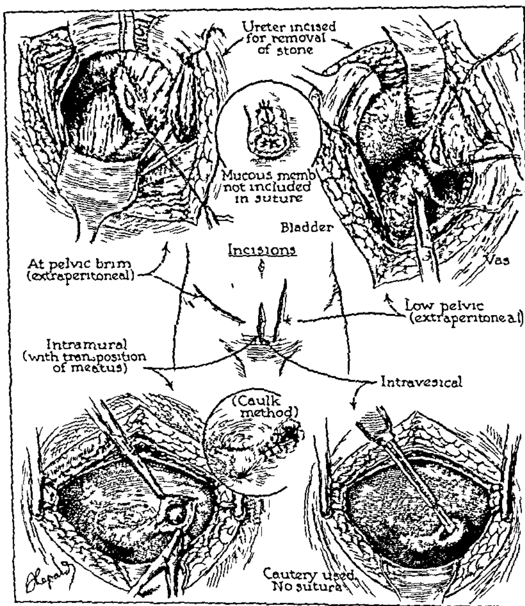
Neck of tract exposed Cut aw y from intestine along dotted line

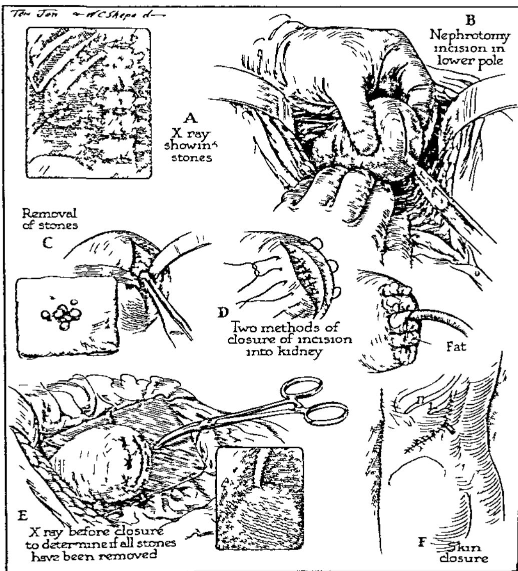


Ford stitch

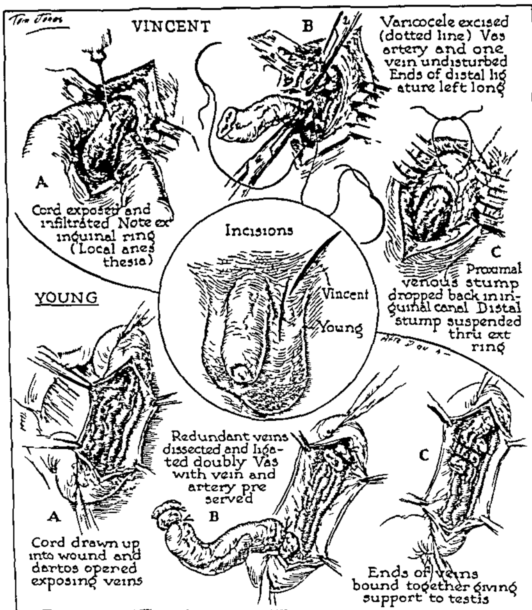


Opening into intestine closed transversely

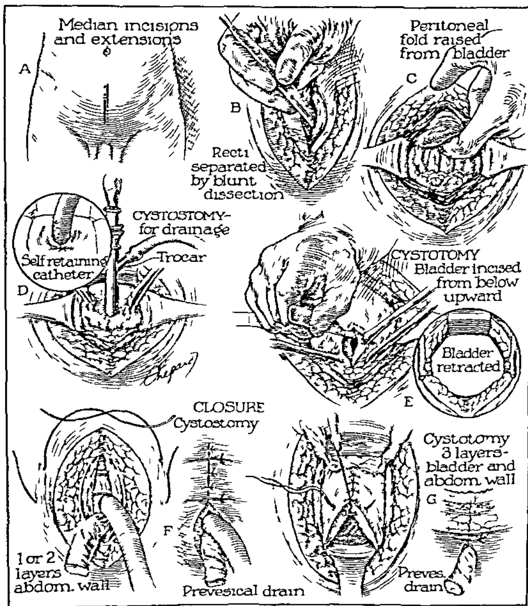

Ureter incised for removal of stone
Mucous memb not included in suture
Bladder
Incisions
At pelvic brim (extraperitoneal)
Vas
Low pelvic (extraperitoneal)
Intramural (with transposition of meatus)
Intravesical
(Caulk method)
Cautery used. No sutura


A
X ray
showing
stones
B
Nephrotomy
incision in
lower pole
Removal
of stones
C
D
Two methods of
closure of incision
into kidney
Fat
E
X ray before closure
to determine if all stones
have been removed
F
Skin
closure

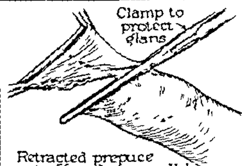
OPERATIONS FOR VARICOCELE (OR VARICOCELECTOMY)



SUPRAPUBIC CYSTOSTOMY AND CYSTOTOMY

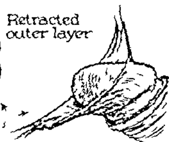


CIRCUMCISION



Retracted prepuce cut off in line parallel with corona





Inner layer trimmed to within one cm of corona





Alternate stitches of layers left long to include strip of vasalined gauze

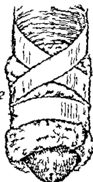


Desired result partly covered glans

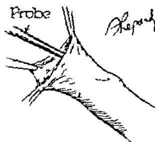
SECOND METHOD

Cut

Dorsal split (Continuous suture of layers)

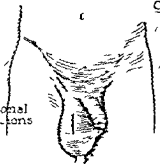


Vasalined gauze dressing

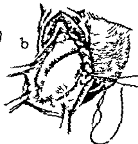


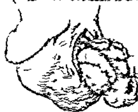
If adherent prepuce separated from glans

HYDROCELE


1


OPEN OPERATIONS
a


Tunica trimmed away
remaining margin
b


2


3 ANDREWS
small opening high in sac
Sac everted upon cord
a

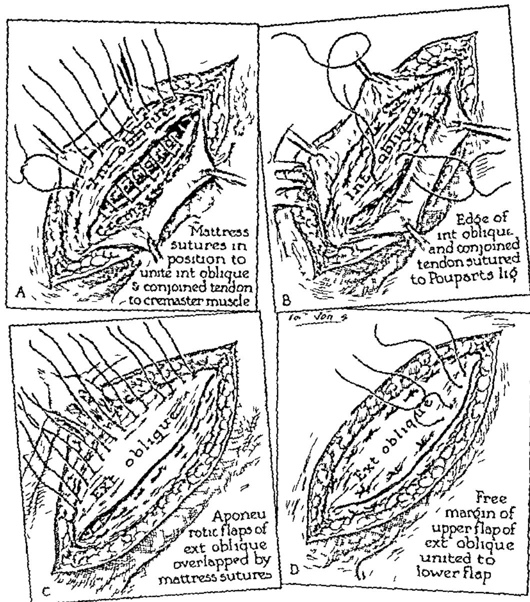

b


4
INJECTION METHOD
a

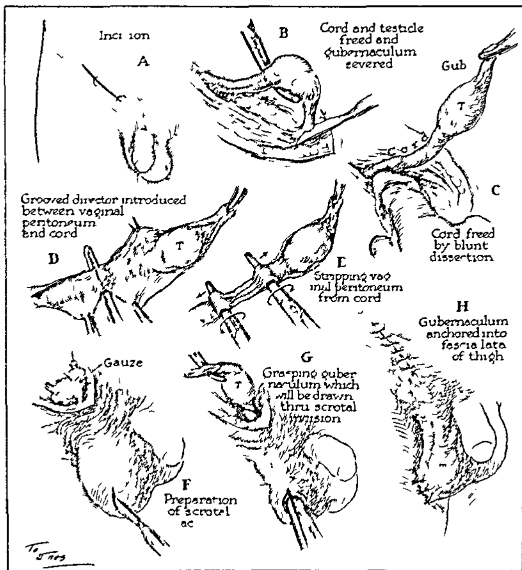

b
of irritant


Massage
c

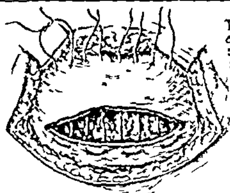
HALSTED OPERATION FOR INDIRECT INGUINAL HERNIA

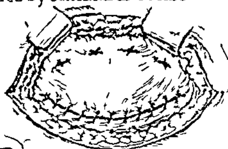


OPERATION FOR UNDESCENDED TESTIS
(McKENNA)

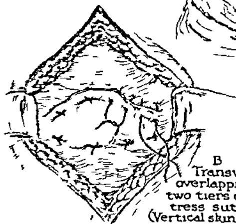


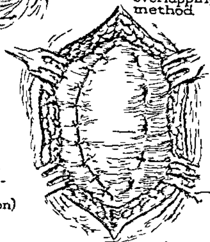
METHODS OF REPAIR IN LARGE UMBILICAL HERNIA



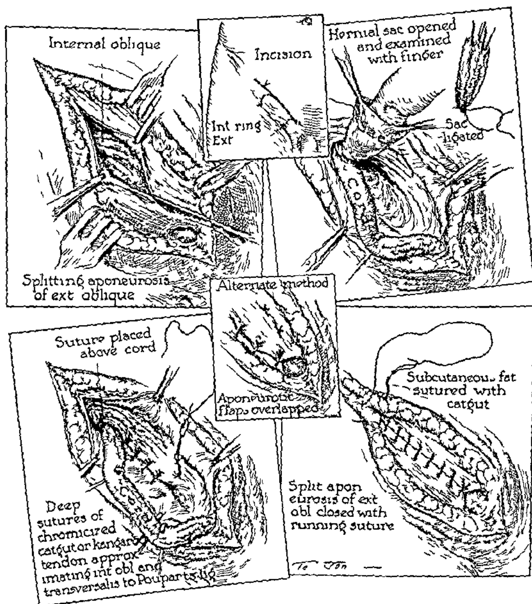




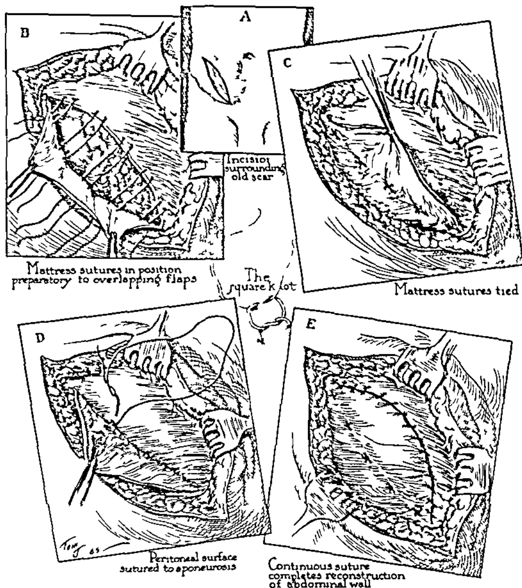




BASSINI OPERATION FOR INDIRECT INGUINAL HERNIA



AN OPERATION FOR POSTOPERATIVE VENTRAL HERNIA (JUDD METHOD)



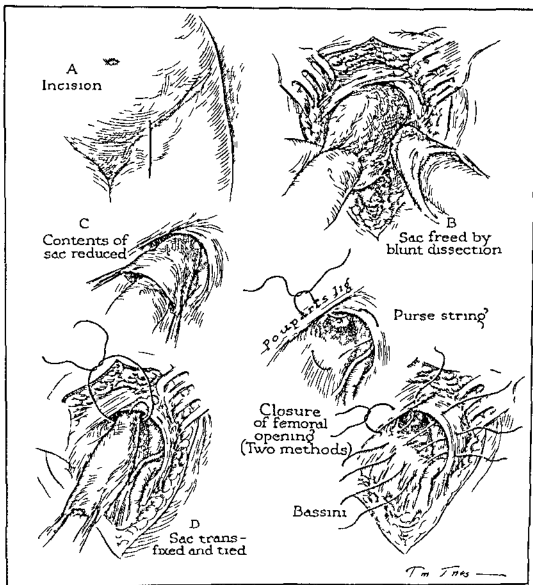
Mattress sutures in position preparatory to overlapping flaps

Mattress sutures tied

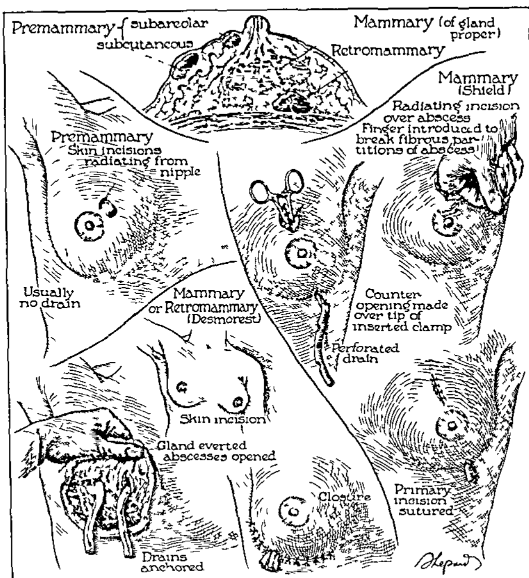
Peritoneal surface sutured to aponeurosis

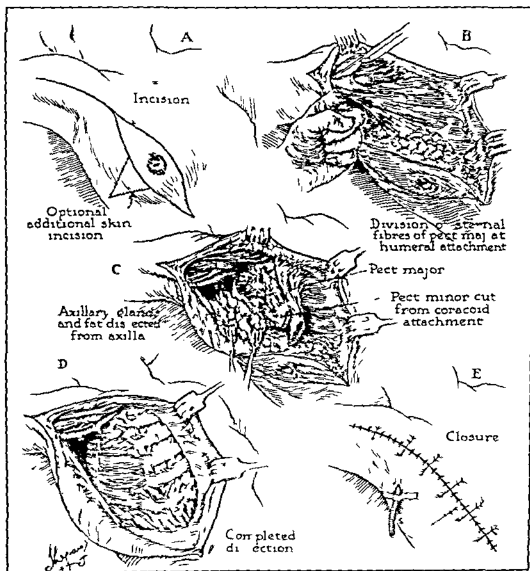
Continuous suture completes reconstruction of abdominal wall

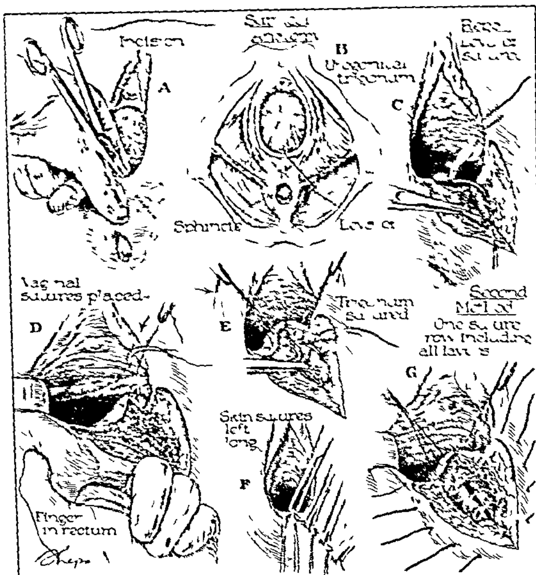
REPAIR OF FEMORAL HERNIA

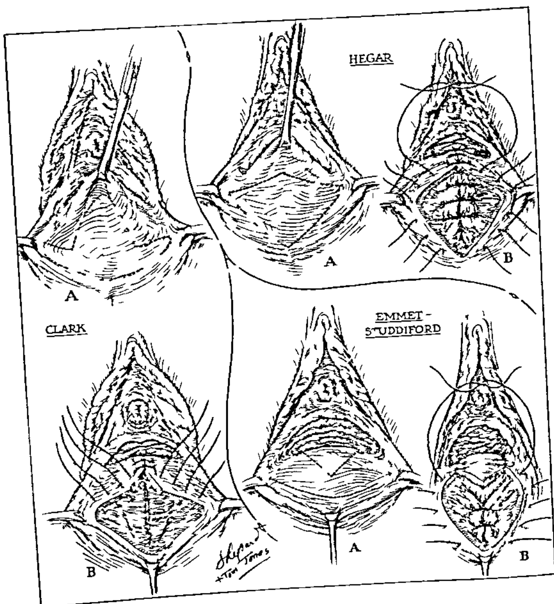


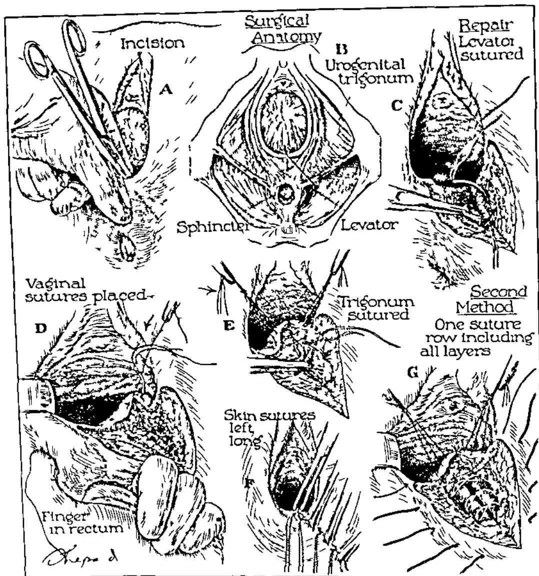
MAMMARY ABSCESS



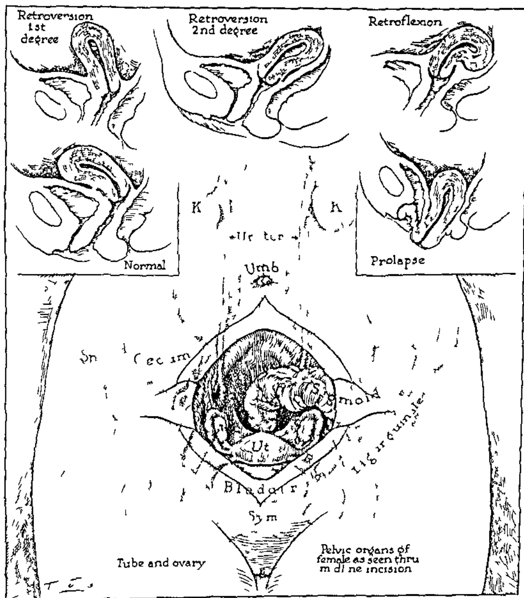

A
Incision
Optional
additional skin
incision
B
Division
fibres of pect maj at
humeral attachment
C
Pect major
Pect minor cut
from coracoid
attachment
Axillary glands
from axilla
D
E
Closure


Incision
A
B
Urogenital trigonum
C
Sphincter
Vaginal sutures placed
D
E
Trigonum sutured
Second Method
G
Skin sutures left long
F
Finger in rectum

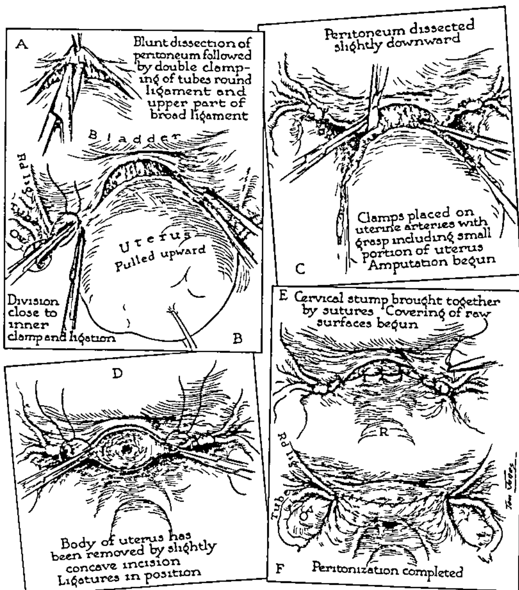

HEGAR
A
A
B
A
CLARK
EMMET-
STUDDIFORD
B
A
B

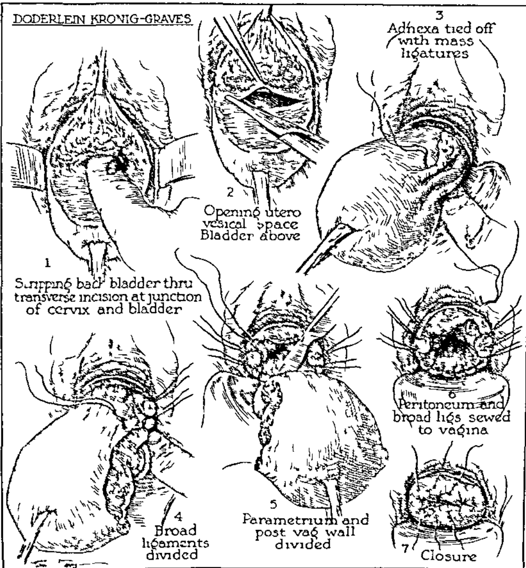

Surgical Anatomy
Incision
A
B
Urogenital trigonum
Repair
Levator sutured
C
Sphincter
Levator
Vaginal sutures placed
D
E
Trigonum sutured
Second Method
One suture row including all layers
G
Skin sutures left long
F
Finger in rectum

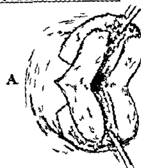
SURGICAL ANATOMY OF THE UTERUS

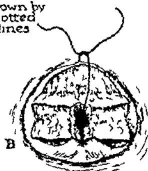


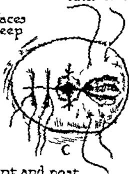
HYSTERECTOMY
(CURTIS)

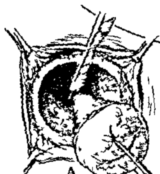


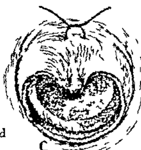

DODERLEIN KRONIG-GRAVES
1
Stripping back bladder thru transverse incision at junction of cervix and bladder
2
Opening utero vesical space Bladder above
3
Adnexa tied off with mass ligatures
4
Broad ligaments divided
5
Parametrium and post vag wall divided
6
Peritoneum and broad ligs sewed to vagina
7
Closure


CURTIS SCHROEDER
A
Cervix split
Portion removed
shown by dotted lines

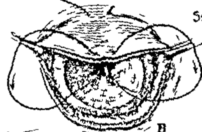

Raw surfaces closed by deep sutures
B
Ant and post lips united to mucosa of cervical canal

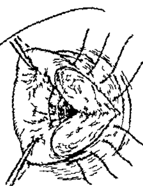

After Curtis
C

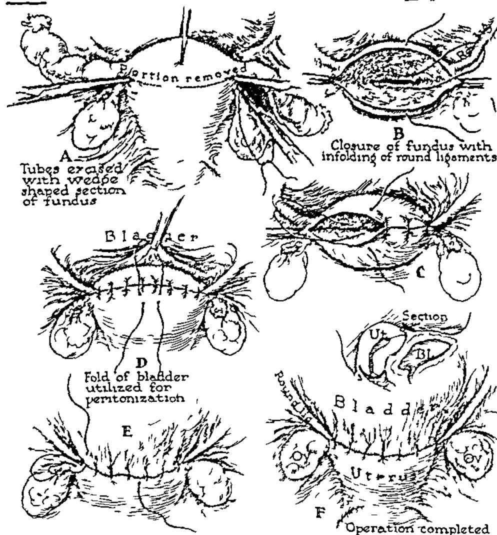

A
Vaginal cuff elevated Cone shaped portion excised

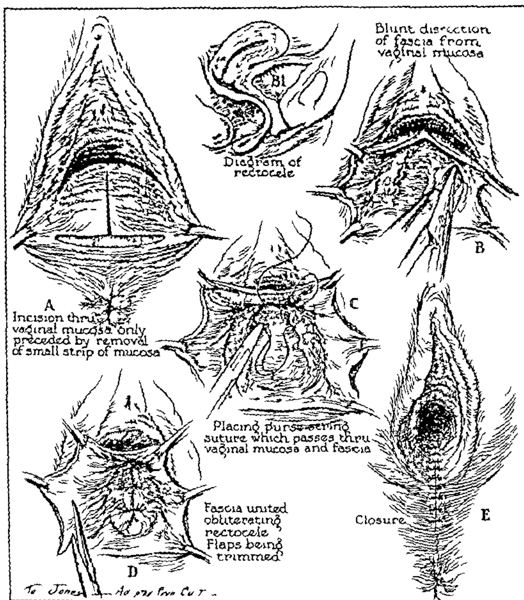

STURMDORF
C
Sturmdorf stitch


Closure
D

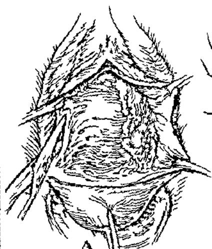

B


GRAVES
EMMET
Repair of cervix


FALLS
Portion removed
A
Tubes erased with wedge shaped section of fundus
B
Closure of fundus with infolding of round ligaments
C
Bladder
D
Fold of bladder utilized for peritonization
E
Section
Ut
Bl
Bladder
Ov
Uterus
Ov
F
Operation completed


Blunt dissection of fascia from vaginal mucosa
Bl
Diagram of rectocele
A
Incision thru vaginal mucosa only preceded by removal of small strip of mucosa
B
C
Placing purse-string suture which passes thru vaginal mucosa and fascia
Fascia united obliterating rectocele Flaps being trimmed
D
Closure
E

ADVANCEMENT OPERATION



A
Fascia separated
from vaginal flaps

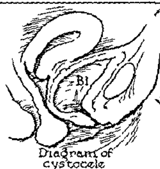
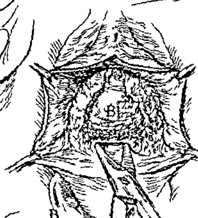
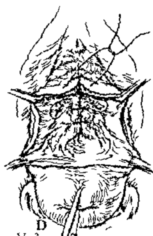


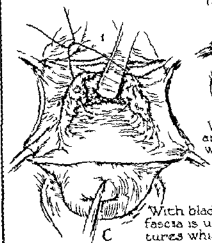
Diagram of
cystocele



B
Bladder freed
by blunt dissection



D
Vaginal flaps trimmed
and united by sutures
which grasp under-
lying fascia

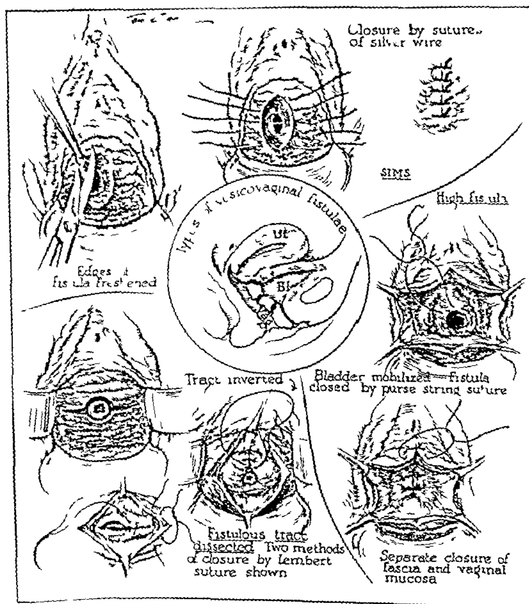


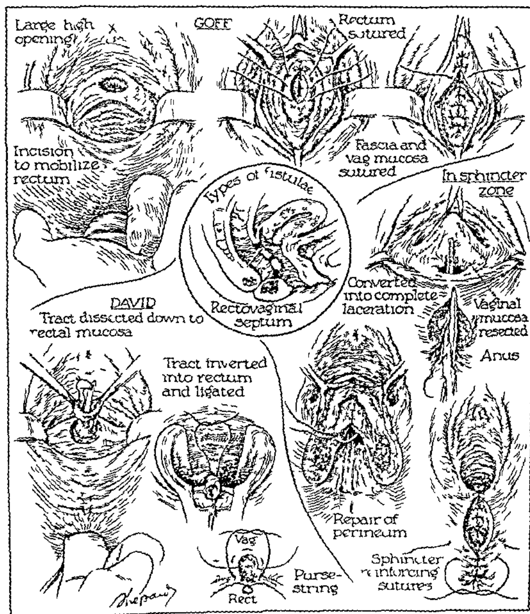
C
With bladder elevated
fascia is united by su
tures which enter
uterus



F
Closure

REPAIR OF VESICOVAGINAL FISTULA




Large high opening
GOFF
Rectum sutured
Incision to mobilize rectum
Types of fistulae
Fascia and vag mucosa sutured
In sphincter zone
Rectovaginal septum
Converted into complete laceration
Vaginal mucosa resected
Anus
DAVID
Tract dissected down to rectal mucosa
Tract inverted into rectum and ligated
Repair of perineum
Vag
Rect
Purse-string
Sphincter reinforcing sutures
Shepard



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